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BRITISH MEDICAL JOURNAL

LONDON SATURDAY DECEMBER 19 1942

RENAL FAILURE AFTER UTERO-PLACENTAL DAMAGE

BY

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There are two conditions in obstetrics in which massive damage affecting the placenta, uterine muscle, or other pelvic tissues may be followed by renal insufficiency and azotaemia—accidental (retroplacental) haemorrhage (Young, 1942) and the trauma of labour (Young and McMichael, 1941). They show the same clinical sequence. (1) There is the initial tissue damage. (2) In severe cases there is "shock," which may be immediately fatal. In milder cases there may be an absence of shock. In cases which survive the shock there are (3) anuria or oliguria, with a urine containing hyaline and granular casts and leucocytes, and (4) a rising blood urea which reaches its maximum usually between the 5th and 9th days and which is followed by death or by an increasing diuresis and eventual recovery. These two clinical states resemble the "crush syndrome" (Bywaters and Beall, 1941). In the latter condition the chief histological changes are found in the kidney; these have recently been fully described by Bywaters and Dible (1942). They consist of a degenerative and necrotic lesion specially affecting the ascending limb of Henle and the second convoluted tubule, usually with the presence of pigmented (myohaemoglobin) casts. We have recently drawn attention to the similarity between the shock-azotaemic state following the trauma of difficult labour and the crush syndrome (Young and McMichael, 1941). Further evidence, to be published later, suggests that this state is by no means a rare sequel of difficult obstetrics.

The other obstetrical condition in which shock and renal failure are relatively frequent—namely, concealed accidental (retroplacental) haemorrhage—is the especial concern of the present communication. The evidence to be adduced again indicates that in the aetiology of the renal failure the same two factors emerge for consideration—the liberation into the general circulation of blood pigment which is excreted by the kidneys, and tubular damage. The clinical syndrome in concealed haemorrhage is confused by the eclamptic phenomenon (pre-eclampsia and eclampsia) which invariably accompanies it, generally in the form of severe albuminuria, hypertension, oedema, blurred vision, etc. This association is no mere haphazard one. For it has long been known that haemoglobinaemia and haemoglobinuria not infrequently occur in eclampsia associated sometimes with renal failure and with a renal lesion exhibiting blood-pigment casts and tubular degeneration. The accidental-haemorrhage syndrome is to be regarded as a variant of the pre-eclamptic and eclamptic picture, with the renal failure element thrust into the foreground.

The purpose of the following communication is to discover how far these similarities between the crush and obstetrical syndromes rest upon any basic identity in regard to genesis. In this connexion the massive ischaemic lesion in the placenta and uterine wall found in the obstetrical state calls for special consideration.

The manner in which tissue trauma leads to renal failure is uncertain. It has been suggested that the blood pigment released from the autolysed muscle may act by causing damage to the tubular epithelium or blockage of the tubular lumina. Alternatively, it is possible that the tubular degeneration is determined by the toxic action of some other material derived from the autolysis of the damaged muscle and that the blood pigment merely represents the myohaemoglobin liberated at the same time and precipitated in the tubules during excretion. There is also to be considered the possible influence of the shock phenomena (circulatory collapse, vasoconstriction) acting alone or in combination with the other factors.

The Accidental-haemorrhage Syndrome

In some cases the patient is known to have been previously suffering from pregnancy toxaemia, and the accidental haemorrhage then forms the critical and terminal phase. In other cases the pregnancy is normal up to the acute onset. This consists of abdominal discomfort and pain, often acute. Faintness and vomiting are common, with pallor, shivering, sweating, and rapidity (sometimes slowing) of the pulse. There may be vaginal bleeding. The blood pressure may be lowered to shock levels, but this is not usual and it is apt to be followed by early death. The urine is completely suppressed or is greatly reduced in amount. It is dark red or plum-coloured and contains a large amount of albumin with hyaline and granular casts and leucocytes. Pigment casts are sometimes present. In the first sample the urine urea may be in high concentration; thereafter it quickly falls to low levels. Within two days the blood urea is raised, and may reach a high level between the 5th and 9th days. The patient succumbs about the 7th to 10th day or, alternatively, there is a free diuresis, a rapid drop in the blood urea, and eventual recovery, which may apparently be complete. This is the picture in the severe type; but all grades of severity are found, and in some cases eclamptic convulsions are present. The lesion consists of marked distension of the decidual vessels with thrombosis and free extravasation in the retroplacental area. In some instances there is an accompanying widespread haemorrhagic lesion in the uterine wall ("utero-placental apoplexy"). The area of placenta thus deprived of its blood supply dies and, in minor cases in which continuing pregnancy is possible, undergoes infarction. In severe cases the massive placental involvement results in early foetal death and delivery. But the maternal circulation may continue and the foetus may survive for hours even after as much as half of the placenta is so thrown out of the blood circuit and is undergoing autolysis. A partial circulation may even persist for some time in this affected segment. The cause of this utero-placental lesion is unknown. It is determined by a critical interference with the maternal circulation by those factors (probably generally hormonal in nature) which are commonly responsible for abortion in the early months of pregnancy. In the present instance, however, they are operating in the later months, when it is alone possible for a partial circulation to persist despite the occurrence of massive autolysis in the adjacent segment of the placenta (Young, 1914, 1942).

The Kidney Lesion.—Bratton (1941) in 6 fatal cases of antepartum bleeding with anuria or oliguria found a renal lesion resembling that seen in the crush syndrome. In none had blood transfusion been given. With the collaboration of Dr. Bratton and the medical superintendents of the hospitals concerned we have had the opportunity of studying the records of five of the cases. In three with anuria and the full renal picture the clinical evidence suggested that the patients had suffered from accidental haemorrhage between the 26th and 28th weeks of pregnancy. In one patient, as Bratton indicates in his paper, there was a haemorrhagic and necrotic lesion in the liver. In one of the remaining two cases the patient suffered from concealed accidental haemorrhage and eclampsia at the 30th week of pregnancy.

Through the kindness of Prof. R. W. Johnstone we have obtained for personal study the clinical notes and pathological material from 4 fatal cases of accidental haemorrhage. In none had blood transfusion been given. This material was submitted to Prof. J. H. Dible, who has kindly furnished the description of the microscopical appearances of the organs and the comments included in the following statement.

Case 1

Para 0+1 abortion; aged 28. March 17, 1940, 6 a.m.: Sudden onset of dizziness and dimness of vision. 8 a.m.: Severe abdominal pain and vaginal bleeding; pale, pinched, cold, and clammy; pulse 70; B.P. 130/80; urine—albumin +++; uterus tense and tender; foetal heart not heard. 1.10 p.m.: Spontaneous delivery of stillborn child weighing 4 lb. 2 oz. (36 weeks' maturity), followed by large amount of dark-red blood clot and torn-up and infarcted placenta. 1.30 p.m.: Pulse soft and irregular, but still slow; glucose-saline given intravenously, with strychnine, adrenaline, and nikethamide (coramine). 2.55 p.m. (1st day): Died. The interval between the onset of the acute symptoms and death was thus 8 hours 55 minutes.

Kidneys.—Slightly softer than usual, with on section a pale-yellow surface in which the cortex and medulla were fairly well differentiated. In the subcapsular region there were a few small haemorrhages. *Microscopical.*—"The tufts are generally rather bloodless. The capsular spaces are filled with protein material. There is marked hyaline droplet degeneration of the cells of the first convoluted tubules. The cells are swollen and desquamating; their brush borders are lost and their lumina are full of debris. This condition is continued into the descending limb of Henle. At one site in the intermediate zone a focus of necrosis with hyaline casts in the ascending limb is found. The second convoluted tubules do not show the same severe cellular change. Their cells are a little pyknotic and they tend to contain casts of a condensed and hyaline type. No pigment or necrosis is found in these tubules. A considerable number of collecting tubules show long dense hyaline casts, but these are not pigmented. *Comment.*—The lesion is an acute 'toxic' tubular nephritis. It is similar to the early stage of the crush syndrome in this respect, but differs from this in that the damage to the first convoluted tubule is more pronounced. *Other organs.*—The lungs are congested, oedematous, and emphysematous, but the liver, spleen, and heart show no noteworthy changes."

Case 2

Para 7; aged 30. Feb. 4, 1937, 11 a.m.: Slipped and fell heavily on stone stairs at 28th week of pregnancy. In the evening she had fairly severe vaginal bleeding and fainted. Feb. 5, 12.15 a.m.: Admitted to hospital; drowsiness; marked oedema of hands and feet; B.P. 135/80; a "few ounces" of dark-brown urine withdrawn by catheter—albumin +++; membranes ruptured artificially. 2 p.m.: No urine passed; catheter withdrew 60 c.cm. of "dark-brown viscid urine"; R.B.C.s and granular and hyaline casts present; blood urea 54 mg. per 100 c.cm. 7.30 p.m.: 10 drops of "oily black urine" withdrawn; under a short gas–oxygen–ether anaesthesia bipolar version was performed and 1/2-lb. weight attached to ankle of child. Feb. 6, 1 a.m.: Delivered; child 3 lb., stillborn; large amount of dark retroplacental clot. During the next 7 days patient had marked oliguria despite a large intake of glucose-saline solution. The blood urea was not recorded, but on two occasions (8th and 10th days) the urine urea was 390 mg. per 100 c.cm. The minimum blood pressure until the terminal stages was 130/70. Feb. 13 (10th day), 10.25 p.m.: Died.

Kidneys.—Moderately enlarged and fairly firm. The surface in each was diffusely congested and the cortex and medulla were fairly well differentiated. The cortex showed some increase in depth. Each capsule stripped readily, exposing a smooth surface, over which multiple petechiae were scattered. *Microscopical.*—"The glomeruli do not show any noteworthy changes. The tubules are generally dilated. The first convoluted tubules contain debris, desquamated cells, and globular masses; they are, however, fairly well preserved and there is no widespread cellular necrosis. Many of the second convoluted tubules show marked lesions. Their interior contains casts, which are made up of granular material that is lightly pigmented. The presence of this pigmented material is associated with a pronounced cellular reaction—desquamation, degeneration, and regeneration of the epithelium and some polymorph infiltration. Similar changes are seen in the ascending limb of Henle. In the region of the second convoluted tubules and in the boundary zone necrotic tubules and foci of cellular reaction (similar to those described by Bywaters and Dible) can be seen. In the medulla there are oedema and foci of lymphocytic and plasma-cell infiltration. The collecting tubules contain pigmented casts and pigmented necrotic cells and show epithelial proliferation. *Comment.*—The picture is practically indistinguishable from that found in the kidney in cases of the crush syndrome. *Other organs.*—The liver and heart do not show any noteworthy changes."

Case 3

Para 0; aged 24. June 1, 1939: Admitted because of oedema of ankles at term; B.P. 130/100. Remained satisfactory. On June 17, 5 a.m., artificial rupture of membranes. 6 a.m.: Labour started. 2 p.m.: Vomiting. 11 p.m.: Sudden onset of severe abdominal pain with collapse and sweating; foetal heart ceased and concealed accidental haemorrhage diagnosed; 1/4 gr. morphine given, and intravenous drip saline. 12 midnight: Delivered by easy low forceps after craniotomy to diminish size of head. Placenta expelled one hour later: no blood loss. Examination of the placenta showed a portion which seemed to have separated prematurely. There was marked oliguria (the maximum daily output being 140 c.cm. on 4th day), and the blood urea on 7th day was 164 mg. per 100 c.cm. Treatment: glucose-saline, 10% glucose, sodium sulphate, 20% glucose. The lochia became offensive. Coma developed and on June 25 (9th day), at 10.10 a.m., the patient died.

Kidneys.—Both swollen and moderately firm. Abnormally broad pale cortex and reddish-brown medulla, both areas being oedematous. Each capsule stripped readily, exposing a smooth pale surface. *Microscopical.*—"The glomeruli tend to be bloodless but show no anatomical change. The first convoluted tubules contain a good deal of debris, are generally dilated, and their epithelium is flattened; the cells are not well preserved and there is some widespread necrosis. The second convoluted tubules are pyknotic. Many of them contain lightly pigmented granular cast material. In connexion with this there is epithelial desquamation and necrosis, some of the necrosed epithelial cells absorbing pigment. Most of the nephrons are affected. Changes in Henle's tubules are minimal. The medulla shows lymphocytic and plasma-cell infiltration. A majority of the larger collecting tubules contain pigmented casts, reproducing the picture of 'blockage' seen after intravascular haemolysis—as, for example, in fatal incompatible blood transfusion. *Comment.*—This picture is essentially similar to that found in the kidney in the fatal anuria of the crush syndrome. *Other organs.*—Liver: Typical patchy eclamptic necrosis. Lung: Oedema, emphysema, acute bronchitis, and early bronchopneumonia. Pituitary: Acute necrosis of the anterior lobe. The heart and spleen show no noteworthy changes."

In the fourth case the appearances were those of bilateral cortical necrosis, the rare lesion which has long been associated with cases of accidental haemorrhage resulting in death with uraemic symptoms. The difference in the causal factors responsible for two such striking variants in the renal lesion is a matter for further study. Meanwhile it is interesting and perhaps relevant that cortical necrosis has been described in a case of traumatic anuria (McFarlane, 1941).

Discussion of the Aetiology of the Renal Failure

The following factors, operating singly or in combination, call for consideration in this connexion: (1) shock, (2) haemolysis and tubular blockage, and (3) a toxic material or toxic materials of tissue origin. For this study we have 5 personal cases associated with renal impairment and a significant rise in blood urea out of a total consecutive series of 79 cases of accidental haemorrhage. All 5 patients recovered.

Shock

This may be severe, and a considerable proportion of the mortality from accidental haemorrhage is due to this cause. That the collapse of haemorrhage does not in the present series explain the kidney lesion is suggested by the fact that,

in 59 consecutive cases of obstetrical haemorrhage (post partum, from placenta praevia, accidental haemorrhage) so grave as to require blood transfusion, renal failure is restricted to the accidental-haemorrhage group (Table I).

TABLE I.—*Severe Haemorrhage at Childbirth necessitating Blood Transfusion. Analysis of 59 Consecutive Cases*

	Cases	Renal Impairment
Post partum	37	0
Placenta praevia	12	0
Accidental (retroplacental)	10	5

This table demonstrates the correlation between renal impairment and accidental haemorrhage and suggests that the former is determined by some factor other than the shock of haemorrhage. Further, it can sometimes be clearly established that the renal impairment antedates the shock phenomena.

Case 4.—Mrs. M., aged 27, walked into hospital at 7 p.m. with lower abdominal pain and thinking she was in labour. She was unable to pass urine, and next morning the catheter revealed an empty bladder. The general clinical condition was good; blood pressure 120/80 mm. Hg. During the rest of the day the suppression continued. At 5.30 p.m. she developed acute abdominal pain with severe shock. Diagnosis: Concealed accidental haemorrhage. Bladder empty. The suppression of urine had thus existed for 22½ hours before the first onset of shock.

Case 5.—Mrs. E., aged 37, wakened at 7 a.m., rose, and passed urine as usual. She prepared her husband's breakfast, and later in the morning, in her usual health, went shopping. At 11 a.m., on the way home, was seized with abdominal pain; walked home and went to bed. At 12 noon felt sick and vomited. Sent to hospital at 5.30 p.m. in condition of shock (with pallor, shivering, perspiration, and rapid pulse), but with B.P. 155/98. Diagnosis: Concealed accidental haemorrhage. 3 c.cm. urine withdrawn by catheter. No urine had been passed since 7 a.m. She thus had suppression for 10 hours, and this antedated the shock.

These cases further exemplify how the causal agency has a selective action on the kidney.

An added argument against the view that the renal failure is a local expression of general circulatory collapse due to shock is the frequent absence of hypotension. In 4 out of the present series of 5 cases of accidental haemorrhage the blood pressure was recorded at frequent intervals, and the respective minimum readings up to the time when the kidney impairment was firmly established were 100/70, 110/90, 155/98, 145/86. The relatively high pressure levels in some of these women are clearly related to the coexisting hypertensive toxaemia.

Dunn and Montgomery (1941) have suggested that bilateral cortical necrosis, the rare variant of the renal lesion, which is also remarkably selective in its character, may be due to circulatory failure from haemorrhagic "shock" with complete stagnation of the blood flow in glomeruli previously damaged by the eclamptic "poison." Such an explanation, however, does not seem to be valid for the lesion now under discussion. We have seen (1) that the selective lesion may be tubular, with a relative immunity of the glomeruli; (2) that renal failure does not follow the shock from other forms of obstetrical haemorrhage (post partum and from placenta praevia) complicating the eclamptic state; (3) that the renal failure may develop before the "shock" while, in other cases, there may at no time be hypotension.

The data invite some further tentative conclusions on the aetiology of the shock phenomena. In accidental haemorrhage shock may be severe and even fatal, and in some cases the blood loss by itself is clearly a determining factor. That, however, there may be another factor, or other factors, is demonstrated by those cases in which the degree of shock is out of proportion to the amount of bleeding (Whitridge Williams, 1925) and by the frequency with which it fails to respond to the therapeutic influence of blood transfusion (Sheehan, 1942). In the evolution of shock in surgical trauma the fall in blood volume caused by the loss of plasma to the damaged tissues is believed to play an important part. In the case of accidental haemorrhage there is no clear evidence of such a mechanism. Although there may be oedema of the uterine wall (especially when the retroplacental bleeding is associated with a muscular lesion—"utero-placental apoplexy") this local loss of blood fluid to the tissues cannot be regarded as an adequate explanation of the total phenomena. We have not found evidence of haemoconcentration, though this may, of course, be obscured by the haemorrhage, and it is known that the eclamptic state may be accompanied with marked haemoconcentration due to the explosive generalized oedema (Zangemeister, 1903). This haemoconcentration, which may develop rapidly in the crisis of the eclamptic state, may, however, be associated with an equally rapid rise in blood pressure, even to high levels, and with a clinical condition which in this respect is the reverse of shock (Dieckmann, 1942). Further, in many instances, although the shock phenomena may be clinically brisk, the accompanying hypertensive state, as in the 4 surviving cases reported in this communication, would seem to protect the patient against the major risks. It is only when the "shock factor" breaks through this protective hypertensive state and paralyses the vasomotor mechanism that the full shock effect is induced. Whether this action is central or peripheral it is impossible to say. This view of the genesis of the initial shock often seen in such cases resembles the conclusions of Noble and Collip (1942) based upon the study of experimental trauma in rats. They conclude that a poison is generated by the damaged tissues and that this can cause death rapidly from shock with little haemoconcentration. Only where death is delayed is there the development of a severe haemoconcentration due to the loss of blood plasma through the capillaries. Glen (1941) has shown, also, that the shock may develop so rapidly after the restoration of the circulation in an ischaemic limb as to suggest the immediate effect of a circulating poison.

We may summarize the above evidence as follows. The data are opposed to the view that the shock mechanism is essential for the production of the renal lesion. This is dependent upon some other influence whose action on the kidney may be strikingly selective. Neither haemorrhage nor the loss of blood fluid to the tissues (local or general) with haemoconcentration is an adequate explanation of the shock phenomena. To explain the full shock effect we must postulate some other factor (toxic agent?).

Haemolysis and Tubular Blockage

The eclamptic phenomenon is apt to be associated with haemoglobinaemia and haemoglobinuria. Many references to these conditions are to be found, especially in German literature. Schmorl (1893), in 2 out of the 17 cases on which his classical monograph on the pathology of eclampsia was based, described the presence of yellow pigment in the collecting tubules of the kidney. In one case, in which the urine was plum-coloured, the pigment was also present in the epithelial cells. Brütt and Schumm (1918) reported 6 cases of eclampsia with haemoglobinaemia in which there were haematin casts in the urine. In a fatal case with marked oliguria there were abundant haematin casts in the straight and Henle tubules. Fahr (1924) found haemoglobin casts in the kidney tubules in 18 out of 33 fatal cases of eclampsia, and regards this appearance as next only in importance to the glomerular changes in the total renal lesion of eclampsia. He points out that this incidence is higher than one would expect from the frequency of haemoglobinuria as clinically recorded in eclampsia by Meyer-Wirz and Geipel (6 in 44), Konstantinowitsch (6 in 30), and Zangemeister (5 in 14). At the same time he points out that the haemoglobin casts are often few in number. In general these German writers have regarded this haemolytic process as one of the side-effects of the eclamptic "poison"—an effect which it shares with other poisons, such as arsenic preparations, nitrobenzol, quinine, etc. The haemoglobinaemia and haemoglobinuria are clearly related to the acme of the eclamptic attack, and subside quickly thereafter. The Continental investigators were also aware of the association between haemolysis and the azotaemic type of renal failure dependent upon tubular degeneration (Brütt and Schumm, 1918; Seitz, 1927; Spitzer, 1934). In this country Dunn and Baird (1933) found haemoglobin casts in the kidneys in 3 out of 10 cases of eclampsia.

These investigations have acquired a new significance by their revelation of the close resemblance between the haemolytic phenomenon in eclampsia and its accompanying renal lesion and the changes found by Bywaters and Beall (1941) to follow a massive ischaemic lesion of muscle and by Bratton (1941) and ourselves in the accidental-haemorrhage syndrome. It has been suggested that in the crush syndrome the anuria may oe due to blockage by the pigmented casts. But, as Bywaters and Beall (1941) have pointed out, any urine excreted in such cases may differ little from a glomerular filtrate, thus indicating the existence of severe damage even in non-obstructed tubules. Further, in an early case there may be tubular lesions in the absence of casts.

The same considerations apply to the kidney in accidental haemorrhage. In a woman who died 9 hours after the onset of symptoms there were no pigmented casts, but the tubular degeneration was evident; whilst in another case, with 22½ hours' anuria, pigmented casts were absent. We have had the opportunity of examining the kidneys in two women who died with anuria, 6 days and 9 days respectively after an eclamptic attack. In the former case there was a typical tubular lesion with blood casts and a blood-urea figure of 173 mg. per 100 c.cm.; while in the latter, in which the tubular degeneration was characteristic and the blood-urea reading 222 mg. per 100 c.cm., there were no pigmented casts. These findings suggest that the blood casts are necessary neither for the initiation of the renal failure nor for the development of the renal lesion.

Toxic Material or Materials of Tissue Origin

The elimination of competing factors in the aetiological field serves to direct attention to the immediate influence of the massive tissue damage, which establishes a basic link between the obstetrical and the crush syndromes. This brings us to the correlation between the "concealed" type of accidental haemorrhage and renal impairment (Table II).

TABLE II.—*Relation of Type of Accidental Haemorrhage to Renal Impairment. Analysis of 79 Consecutive Cases*

Haemorrhage	Cases	Albuminuric Toxaemia	Toxaemia + Renal Impairment
Revealed ..	59	7 (11·8%)	0
Concealed ..	20	13 (65·0%)	5 (25%)
Totals ..	79	20	5

These results conform to those of other observers. The table shows that the albuminuric type of toxaemia is much more frequent in "concealed" (65.0%) than in "revealed" (11.8%) cases, and that the renal insufficiency is associated especially with the "concealed" type.

The distinctive features of the utero-placental lesion of "concealed" accidental haemorrhage have been discussed elsewhere (Young, 1914, 1942). One feature of immediate relevance is that after the production of the lesion, which in the cases we are discussing generally involves as much as half and sometimes even more of the organ, the placenta is retained for some time within the uterus. Where the circulation is maintained in the undamaged portion, with resulting foetal survival, the conditions are such as to favour the escape into the systemic blood stream of any toxic materials which may be generated in the dying area. The circumstances are then similar to those which have been postulated in the case of surgical trauma after the circulation has been re-established in the crushed limb. To this analogy we referred many years ago (Young and Miller, 1921). Elsewhere we (Young, 1942) have given evidence that the "toxaemic" state is immediately related to the massive placental lesion. Thus there is a recognizable quantitative relation between the severity of the toxaemia, on the one hand, and the mass of placenta involved and the period of foetal survival, on the other. When the lesion is so fulminating as to cause complete initial detachment there is no toxaemia, and where, after the onset of toxaemia, the lesion progresses to the stage of causing foetal death there may be an abrupt decline of the toxaemia. This evidence, and evidence of a like nature in ordinary cases of eclampsia and pre-eclampsia, in which, however, there is generally no history of accidental haemorrhage, have formed the basis of the placental hypothesis of the eclamptic phenomenon (Young, 1914, *et seq.*). Evidence has been given that the interference with the uterine circulation which causes the placental lesion is the expression of an antecedent abortion taint (Young, 1927, 1942).

It is firmly established that renal failure with azotaemia is rare in eclampsia and pre-eclampsia. The relatively high incidence (25% in the present series) of renal impairment in concealed accidental haemorrhage would seem, therefore, to be determined by some factor introduced into the eclamptic and pre-eclamptic state by the conditions obtaining in concealed haemorrhage. What this factor is we do not know. It does not seem to connote a quantitative relation to toxaemia, for renal failure is rare even in severe eclampsia not associated with concealed haemorrhage. The massive muscular lesion in the uterus, to which reference has already been made, is especially identified with cases of concealed haemorrhage, and it provides a striking analogy to the conditions in the crush syndrome. But there is some evidence that this lesion may be present in a marked degree without renal failure (Whitridge Williams, 1925; Dieckmann, 1936). Nevertheless it merits fuller consideration. Its existence helps to explain the very high incidence of puerperal sepsis in such cases (Whitridge Williams, 1925; Gibberd, 1936; Bratton, 1941).

The immediate cause of the bleeding in the decidua and muscularis is not clear. There would seem to be no doubt that it is an expression of the "abortion taint," to which reference has already been made and which has been discussed more fully elsewhere (Young, 1942). Reasons have been given for the view that it precedes the placental autolysis (Young, 1914, 1942). This evidence is, however, not unequivocal, and it remains possible that the placental degeneration antedates and determines the retroplacental and muscular lesions. It cannot be claimed that the haemorrhagic lesions are due to a systemic "toxaemia," because out of 79 cases of accidental haemorrhage albuminuric toxaemia was absent in 59, including 7 of the 20 cases of the concealed type (Table II). It is possible, however, that the massive blood effusions in these sites are due to vascular damage by a toxic agent locally produced, and that the purpuric and haemophilia-like haemorrhages occasionally found in accidental haemorrhage in such distant sites as the nose, stomach, and subcutaneous tissues (McGoogan, 1935; Dieckmann, 1936) may be a more generalized manifestation of the same factor. On this question further information is desirable.

Summary

The foregoing clinico-pathological study of the syndrome in concealed accidental haemorrhage suggests the following proximate causes: (1) The syndrome is determined by a massive utero-placental lesion of ischaemic origin. (2) The renal failure characterized by tubular degeneration and azotaemia is determined by a toxic material derived from tissue autolysis. (3) The shock element and the haemolysis which are frequently present may have a similar origin.

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REFERENCES

Bratton, A. B. (1941). *Lancet*, **1**, 345.
Brütt, H., and Schumm, O. (1918). *Z. Geburtsh. Gynäk.*, **80**, 145.
Bywaters, E. G. L., and Beall, D. (1941). *British Medical Journal*, **1**, 427.
—— and Dible, J. H. (1942). *J. Path. Bact.*, **54**, 111.
Dieckmann, W. J. (1936). *Amer. J. Obstet. Gynec.*, **31**, 734.
—— (1942). *The Toxaemias of Pregnancy*, St. Louis.
Dunn, J. S., and Baird, D. (1933). *J. Path. Bact.*, **37**, 291.
—— and Montgomery, G. L. (1941). Ibid., **52**, 1.
Fahr, T. (1924). Article in *Die Eklampsie* (Hinselmann, H.), Bonn, 252.
Gibberd, G. F. (1936). *J. Obstet. Gynaec. Brit. Emp.*, **43**, 50.
Glen, A. M. (1941). *British Medical Journal*, **2**, 875.
McFarlane, D. (1941). *J. Path. Bact.*, **52**, 406.
McGoogan, L. S. (1935). *Amer. J. Obstet. Gynec.*, **29**, 576.
Noble, R. L., and Collip, J. B. (1942). *Quart. J. exp. Physiol.*, **31**, 187.
Schmorl, G. (1893). *Path.-Anat. Untersuchungen über Puerperal-Eklampsie*, Leipzig.
Seitz, L. (1927). Halbann-Seitz, *Handb. d. Biol. u. Path. d. Weibes*, **7**, Teil I, 647 Berlin.
Sheehan, H. L. (1942). *Lancet*, **1**, 616.
Spitzer, W. (1934). *Arch. Gynäk.*, **157**, 267.
Williams, J. Whitridge (1925). *J. Obstet. Gynaec. Brit. Emp.*, **32**, 259.
Young, J. (1914). Ibid., **26**, 1.
—— (1927). Ibid., **34**, 279.
—— (1942). Ibid., **49**, 221.
—— and Miller, D. A. (1921). *Proc. roy. Soc. Med.* (Obstet.), **14**, 247.
—— and McMichael, J. (1941). *British Medical Journal*, **2**, 887.
Zangemeister, W. (1903). *Z. Geburtsh. Gynäk.*, **50**, 401.

LOCALIZED TYPHOID FEVER OUTBREAK IN GLASGOW, 1942

BY

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The following is a description of a small localized outbreak of typhoid fever which presented some rather unusual features and for that reason is considered to be worth recording. The cases, of which there were 41 in all, occurred among the staff and customers of a butcher's shop in one of the poorer districts of Glasgow. The outbreak took place at the end of winter at a time when otherwise the city was free from enteric infections.

General Description of the Outbreak

The first indication of the existence of typhoid fever came on Feb. 6, when 3 cases, all in one family, were diagnosed as this disease. These patients had been admitted to an infectious diseases hospital on Feb. 4. A second group, of 4 cases, consisting of a mother and three children, were removed to another infectious diseases hospital on Feb. 6; and a third family group, consisting of two children, came to notice on the following day. Up till this time all the patients had been women or young children; but on Feb. 9 a fourth family became affected, the patients being two adolescent males aged 15 and 17. Thus within the first two days of our knowledge of the outbreak three families were involved, giving rise to 9 cases.

At first the age and sex distribution caused the investigation to be concentrated on the milk supply, which was common to the first three families; but before reports could be obtained upon the bacteriological specimens submitted, further cases had come to light in which there was no obvious connexion with the dairy. The preliminary investigation had, however, shown that all the infected families received their meat supplies from a butcher's shop in the district, though the usual routine inquiry had failed to incriminate any special meat product. It became clear, however, that the butcher's shop was the only common link between the cases. Specimens of faeces and blood were examined from the staff, which consisted of five persons, with the result that one male employee was found to have *B. typhosus* in stools and urine and a blood agglutination for *B. typhosus* of 1 in 2,500. A second male employee had a positive agglutination reaction (1 in 250), but in his case there were no other positive findings even after investigation in hospital. He had been inoculated against typhoid during the last war. The former case (J. P., aged 62) was ultimately regarded as the probable cause of the outbreak. This man subsequently died of typhoid fever in hospital, and his case is discussed in more detail below.

Further investigation disclosed sickness, later confirmed as typhoid fever, in a female employee who had left the butcher's employment on Jan. 24—that is, before the occurrence of the cases. She lived in another part of the town. The date of onset in her case—Jan. 27—coincided with the starting of the epidemic, so that she is to be regarded merely as one of the cases and not as the original source of infection.

Intensive house-to-house visitation of the district was carried out by the medical officers and sanitary inspectors, and at the same time a circular letter was addressed to local medical practitioners advising them of the presence of the disease. Suspicious febrile cases were removed to hospital for observation, and a frequent and careful check-up was made on all family contacts. The intensive visitation and follow-up of contacts were generally successful in preventing the occurrence of secondary cases. Daily visits were paid to the butcher's shop, and a complete overhaul was made of the hygienic arrangements, which were on the whole of a very low order. All cooked meats found in the shop were destroyed. Some of the customers' ration cards were in an incredibly filthy condition, and it was observed that the shop-assistants handled these cards and then handled meat. By arrangement with the local food office large numbers of ration cards were withdrawn and fresh ones issued. This may not have had any bearing on the genesis or spread of the outbreak, but nevertheless it is a matter worthy of careful consideration from the point of view of the hygiene of food-handling generally.

One case occurred among the attendants of a public washhouse in the area. This patient had no direct connexion with the butcher's shop and took no food at all in the district; but since many of the patients' families were in the habit of taking clothes to the washhouse, he was probably infected by an article of clothing belonging to a typhoid case, although this was never definitely proved.

Analysis of Cases

Time Distribution.—There were 35 primary cases, and, of these, 30 sickened between Jan. 27 and Feb. 3, a period of eight days: 26 of them sickened in the first five days. The following table shows the dates of onset and admission to hospital.

Date of onset	January					February							Total Cases
	27	28	29	30	31	1	2	3	8	14	15	18	
Cases ..	2	3	4	11	6	1	1	2	1	1	1	2	35

Date admitted	February															
	2	4	5	6	7	9	10	11	12	14	16	17	18	20	21	25
Cases ..	1	3	1	5	4	1	2	1	2	6	3	1	2	1	1	1

35

There were, in addition to the 35 primary cases, six secondary ones in which infection could be traced to one or other of the primary cases. These consisted of 3 clinical cases and 3 symptomless carriers.

It is apparent that the infection must have been distributed on or around Jan. 16. The patient J. P. was isolated on Feb. 20, and there is a strong presumption that he must have been a potential source of infection while working in the shop throughout the whole period up to that date. If he was the cause of the epidemic he must have transferred infection to foodstuffs in large amount during the few days around Jan. 16. The dropping cases towards the end of February can be explained by later infection from J. P. or by a much-extended incubation period.

J. P. was a man of irregular habits who lived in model lodging-houses and was somewhat addicted to alcohol. He was careless as regards his person, and as an example of this he had a large untreated varicose ulcer of some 20 years' duration. He maintained from the first interview that he had no symptoms, and indeed it was with some difficulty that he could be persuaded to give the necessary specimens for examination. On Feb. 20 *B. typhosus* was reported in a sample of faeces, and arrangements were made for his removal to hospital; but even on that day he was at work in the shop, and when interviewed by the medical officer he denied that he was in any way ill. Later in the day, in hospital, it was found that he had a moderate pyrexia and some degree of splenic enlargement. Subsequently he developed bronchopneumonia and died on March 6. Post-mortem examination confirmed the diagnosis of typhoid fever. The spleen was considerably enlarged; Peyer's patches were acutely inflamed and oedematous but not ulcerated. This patient may either have been a carrier who became a clinical case or he may have been an ambulant case somewhere about the middle of January, with a relapse in February. The date of his last attack is not definitely fixed, but, according to the clinical signs in hospital, was probably some time about Feb. 15. The very high titre of his blood agglutination reaction would appear to indicate that his illness following admission to hospital was not his primary attack, although from the end of January right up till Feb. 20 he was seen by a member of the staff of this department and made no complaint as regards his health. Thus, in the absence of definite pointers, no detailed clinical examination was made, but had there been such an examination it might have led to an earlier diagnosis. An important point emerges, however—that in the search for carriers the question of ambulant or

relapsing cases should be borne in mind, particularly when dealing with the lodging-house type of patient.

Age and Sex Distribution.—The age and sex distribution of the 35 primary cases were as follows:

Age Group	–1	–5	–10	–15	–20	–25	–30	–35	–40	–45	–50	–55	55+	Total
Males ..	–	2	5	1	2	–	–	2	1	–	–	–	1	14
Females ..	–	3	3	4	2	–	2	4	1	–	–	1	1	21
Total ..	–	5	8	5	4	–	2	6	2	–	–	1	2	35

Although in the early stages of the outbreak women and young children were mostly affected, some adolescent and adult male cases soon followed. The table shows more children under 10 and a higher proportion of women than one would expect in a meat-borne outbreak. It may be that the women and children consumed the ready-prepared meats—the tinned beef and other canned meat products which were sold in the shop by weight—whereas the men were more likely to get the chops and steaks, which, of course, would be cooked at home. It is clear that in investigating typhoid epidemics the age and sex groupings of the early cases may be misleading if the investigator does not maintain an open mind on the consumption of different foodstuffs at different ages. The case for a differential age and sex incidence in milk outbreaks has never been convincing, and any such preconceptions should be discarded.

Secondary Cases.—The secondary cases—i.e., cases infected directly from one or other of the primary cases—numbered 6, but three of these were actually symptomless carriers. The remaining 3 had typical typhoid fever. One of these was a nurse in an infectious diseases hospital. These secondary cases are excluded from the tables so that the description of the epidemic may be confined to infections contracted directly from the butcher's shop.

Family Distribution.—In all, 15 families were involved. In 10 families there were multiple cases: 5 had two cases each, 2 had three, 2 had four, and 1 had five. Thus an exceptionally high proportion of multiple family cases occurred in this outbreak.

Housing and Social Circumstances.—All the cases occurred in 15 tenement houses, 12 of which had two apartments, 2 had one apartment, and 1 had three apartments. The patients were thus all from the poorer working class. As regards spatial distribution, the great majority of the cases occurred in a very circumscribed area surrounding the butcher's shop, but a few arose in distant parts of the town. In the latter, however, direct personal contact was clearly established with the original focus. For example, a woman aged 29 was taken ill on Feb. 2 and was removed to hospital on Feb. 12. Her home address was far removed from the other cases, but she worked in a factory beside one of the patients, whom she visited about the middle of January, partaking of some corned meat.

Clinical Types of Disease

The onset of illness was generally rapid, usually with diarrhoea, abdominal pain, and vomiting. There was, as already noted, an unusually marked tendency for the disease to attack several members in one family. The times of sickening of these cases were often so close together as to raise the question of food-poisoning; and, indeed, 11 of the 35 primary cases were so notified to the department, the diagnosis probably being suggested by the rapid onset. Only in 8 cases was typhoid fever intimated as the probable diagnosis before admission to hospital.

The disease in hospital tended to be severe, and ran the typical course of typhoid. Of the 38 clinical cases admitted (including the 3 secondary clinical cases), 5 terminated fatally—a rate of 13%. Case-to-case infectivity was comparatively low, and none of the patients became a persistent carrier, the usual criteria for dismissal from hospital—namely, three negative faeces and urine examinations—having been satisfied.

Commentary

A meat outbreak of this nature is a comparatively rare occurrence, but with the increasing proportion of canned and processed meats being distributed it is not unlikely that outbreaks spread in this way may become more frequent. The danger lies, of course, in the handling of preparations which are usually eaten without further cooking, such as corned beef, pressed beef, and canned meats of various kinds, the cans being opened within the retailer's premises and the meat sold by weight in small quantities over the counter. Cooked meats sold by retailers may also be infected. But even meat and meat products which are usually cooked in the home are now exposed to much-increased handling in distribution, and this in itself may constitute an added danger. The sausage particularly is suspect, because it is doubtful if, in cooking, its centre always reaches a very high temperature.

The meat which was the vehicle of infection was heavily infected for a few days in the middle of January. When the patient J. P. was found to have *B. typhosus* in samples of faeces and urine it was naturally concluded that he must have been the source of infection. He was employed almost entirely in the back shop, cutting up carcases into joints, etc., for sale over the counter. He did not normally handle canned meat, nor did he serve customers, but is said to have done so on occasion. He was by reason of his personal habits a very likely type of man to convey any infection he may have had to whatever he handled. Unfortunately for the complete acceptance of this theory, shortly after admission to hospital he was himself discovered to be a case of typhoid fever, dying later of a pulmonary complication, the active typhoid being confirmed by post-mortem examination. Therefore, if he is to be regarded as the source of the outbreak we are driven to put forward the two possibilities already mentioned—that he was a chronic carrier who developed clinical disease, or that he had had an ambulant attack of typhoid with a clinical relapse. On the other hand, he may simply have been infected in the same way as all the others, in which case the source of infection must remain unknown. No cases occurred through infection from the shop during the period when he was known to carry typhoid bacilli—namely, the few days prior to Feb. 20. His discovery as an actual or probable source of infection was thus made after the epidemic was over, and no further cases have arisen from this focus up to the date of publication.

With regard to the sending out of circular letters to practitioners warning them of the existence of typhoid fever, while this may be of considerable value, it should not be allowed to take the place of a house-to-house visitation and search for cases, particularly if the outbreak is localized. Many cases of illness in the area were thus traced to infectious disease hospitals and to wards of general hospitals, having been admitted with a diagnosis of pneumonia, influenza, cerebrospinal fever, or enteritis. In fact, as mentioned already, only 8 were actually sent to hospital as typhoid fever. The active search for cases presumably had its reward in the small number of secondary infections.

In this outbreak the first five families had the same milk supply, and although they dealt with the same butcher no particular kind of meat appeared to have been consumed by all cases. Furthermore, the butcher's clientele was far wider than the dairyman's. Suspicion at first therefore rested on the dairy, and although general supervision was exercised over the butcher's shop, bacteriological investigation was at first confined to the dairy staff. Other cases continued to arise from the same milk supply, and even in instances where the milk supply was stated to be from another source, one could not be sure that casual purchases from the suspected dairy had not been made. After an exhaustive examination of the milk supply had yielded entirely negative results, more detailed attention was directed to the butcher. He had at first not been too co-operative, but finally he and his staff provided all the specimens required. By this time, however, it was evident that the peak of the outbreak was past. The butcher probably had about 2,000 rationed customers. Thus the maximum risk to these customers, among whom 35 primary cases occurred, was 1.75%.

The exceedingly low standard of hygiene and general cleanliness in the butcher's shop must also be commented upon. It is feared that such conditions are common in the poorer quarters of towns. It may be remarked, too, that shortage of good-quality skilled labour and other difficulties are matters of concern at the present time.

REFERENCE

Davies, I. G., Cooper, K. E., and Fleming, D. S. (1942). *Lancet*, 1, 129.

JAUNDICE PRESENTING UNUSUAL FEATURES

BY

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Four cases of jaundice coming under observation at a Naval hospital within a very few months presented unusual features. The pathological reports upon material removed at operation from the liver of two patients with "subacute hepatitis" constitute a valuable addition to the case records; the following is the story of "four instructive mistakes."

Case I. Jaundice due to Subacute Hepatitis: Exploratory Laparotomy: Recovery

An officer aged 24 was suddenly seized with acute abdominal pain at the end of Jan., 1942; it was fairly generalized, but the maximal intensity was in the epigastrium. The pain was colicky, and came on in spasms, which "doubled him up" and were followed by intervals of comparative freedom, although a dull ache persisted between the "spasms." This first attack lasted about 12 hours, but was not associated with vomiting; the pain gradually wore off. For nearly two months after this attack the patient had little appetite, felt "out of sorts," and experienced occasional pain of moderate severity in the upper abdomen. During early April a second stage may be said to have begun with frequent severe attacks of abdominal pain at night; there was no radiation of pain to the back or lumbar region. His urine was dark in colour and his skin and conjunctivae looked slightly yellow; there was no pruritus.

His general condition deteriorated, and on admission to a Naval hospital for further investigation the jaundice was marked and of a deep yellow colour; all pain had now disappeared. He was considerably emaciated, but cheerful and optimistic in outlook. Severe persistent headache and dimness of vision were other symptoms; at no time was there any vomiting, although nausea was complained of occasionally after meals. The liver was slightly enlarged and tender; the gall-bladder could not be felt: the spleen was not palpable. The tongue was furred; the teeth were good, but there was considerable sponginess of the gums, which bled on the slightest pressure. No enlargement of glands in axillae, neck, or groin was found. The urine was dark and contained bile pigments and bile salts.

A direct van den Bergh gave an immediate positive reaction. Quantitative indirect gave 7.2 mg. (14.4 van den Bergh units). Paul-Bunnell test was negative. Blood picture: R.B.C., 4,550,000; Hb, 86% (Haldane); C.I., 0.95; leucocytes, 5,200—polymorphs 45%, lymphocytes 45%, large mononuclears 5%, eosinophils 2%, mast cells 0, basophils 0; B.S.R. (Westergren), 11 mm. in 1 hour, 22 mm. in 2 hours; Wassermann, negative. Radiographs revealed no opaque calculi. The pulse was regular about 80; temperature showed a slight evening rise. The past history disclosed nothing of significance. He had never served outside British waters.

The clinical picture was not characteristic of any of the more frequent types of jaundice, but the most probable diagnosis appeared to be an obstructive jaundice due to cholelithiasis. The prolonged jaundice was considered to necessitate an exploratory laparotomy. After the liberal administration of glucose and vitamin K, operation was performed on April 21. The liver was moderately enlarged, but its surface smooth and its outline even; nothing abnormal was seen in the appearance or texture of the gall-bladder. No gall-stones could be felt in gall-bladder or ducts. An enlarged lymph gland was found near the cystic duct, and two more were easily palpable along the common bile duct, but it was obvious that these two glands were not obstructing the flow of bile; the lesion was evidently intrahepatic. Two of the lymph glands were removed for microscopical purposes and a small portion of liver was also resected. Bleeding at the operation was minimal.

Pathological Report (Dr. W. W. Woods).—"Subacute hepatitis: There is severe albuminous and vacuolar degeneration of the liver cells, their cytoplasm being swollen, coarsely granular, and vacuolated, and their nuclei showing karyolysis. In frozen sections sudanophil fat can be found in only a few scattered cells. Disappearance of a few liver cells as the result of necrosis has occurred in the centres of the lobules, where there is conspicuous dilatation of the sinusoids. There is bile pigmentation of the liver cells, but there are only a very few bile thrombi in the canaliculi. Regeneration of parenchyma is indicated by many cells with two nuclei, some of them having deeply eosinophilous cytoplasm; only one mitotic figure can be found. Inflammatory infiltration is almost confined to the portal systems, extending thence only slightly between liver cells. It is more severe in the smaller than in the larger portal systems. It consists of numerous lymphocytes, a few eosinophil leucocytes, and very few neutrophil leucocytes. There has been slight proliferation of fibroblasts, but there is no fibrosis. The bile ducts are normal and empty. In the lymphatic glands from the region of the cystic and common bile ducts there is a pronounced degree of hyperplasia of the endothelial cells of the lymph sinuses (sinus catarrh)."

Post-operative progress was uneventful. Glucose was given freely, and occasionally small doses of calomel and magnesium sulphate. The jaundice began to diminish as the general condition improved, and six weeks after operation had entirely disappeared. The officer was ultimately sent on sick-leave.

Case II. Jaundice due to Subacute Hepatitis: Exploratory Laparotomy: Death Two Months after Operation

An officer aged 34 complained in Aug., 1940, of a sensation of fullness in the abdomen, flatulence, loss of appetite, and general debility, present for some weeks; no previous history of any similar illness. He was jaundiced, the icterus being of moderate intensity. The abdomen was somewhat distended, the distension being uniform; the liver could be palpated beneath the right costal margin.

After several weeks, during which the jaundice increased somewhat in intensity, he was admitted to a Naval hospital. By this time jaundice was marked, and the patient listless and disinterested; he had lost much weight, and his appetite was poor. The abdomen was distended, tumidity being most pronounced in the right hypochondrium, the musculature of which showed some rigidity. The liver was enlarged, and its lower border was felt three finger-breadths below the costal margin; the outline appeared fairly regular, and there was tenderness on pressure over it. The gall-bladder was not palpable: no enlargement of spleen or kidney could be detected. The glands in the groin, axillae, and neck were not involved. Rectal examination yielded no positive information of value. The urine contained bile salts and bile pigments.

Faeces were slate-grey in colour; total fats 64.48 g.%—neutral fats 2.8%, soaps 36.68%, free fatty acids 25%; no pathogenic bacteria, cysts, or ova. A blood count showed: R.B.C., 4,110,000; Hb, 88% (Haldane); C.I., 1.08; leucocytes, 6,800—polymorphs 51%, lymphocytes 43%, large mononuclears 4%, eosinophils 2%. Slight anisocytosis and achromia were noted. Fragility of red cells, bleeding time, and coagulation time were within normal limits. The van den Bergh gave an immediate direct reaction. The laevulose-tolerance test showed no impairment of hepatic efficiency. The Wassermann reaction was negative on several occasions. A straight radiograph showed no opaque gall-stones. The gall-bladder was not seen by opacol radiograph. No calculus or other abnormality seen. The patient stated that during the previous 6 or 8 months while serving in small ships he had frequently been exposed for two or three hours daily to acetylene fumes in his cabin. However, no others exposed to similar fumes had reported sick.

The hope still lingered that the case might be one of "catarrhal jaundice," and initially in hospital the patient was treated expectantly by glucose, fat-free diet, and an occasional dose of calomel and magnesium sulphate. His condition, however, steadily declined; his appetite and weight decreased, and his jaundice became more intense. The possibility of a neoplasm involving the main bile channel now obtruded itself more and more menacingly: exploratory laparotomy was considered necessary. At operation the liver was found to be much enlarged and of firmer texture than normal; here and there the organ showed definite scarring, and a definite thickening could be felt in the portal fissure. The gall-bladder was of small size, whitish, and *quite empty*. The common hepatic and bile ducts were not dilated, and the obstruction was obviously above the junction of the hepatic and cystic ducts; the thickening in the portal fissure seemed to localize the obstruction to the very commencement of the extrahepatic canals. The spleen was not enlarged. A wedge of liver tissue was removed for microscopical examination. The findings at operation suggested either a malignant growth in the portal fissure or a syphilitic hepatitis despite the negative Wassermann reaction. Further serological tests also proved negative.

Pathological Report (Dr. W. W. Woods).—"Subacute hepatitis with portal fibrosis: The portal fibrosis is of a subacute, active, recent type. Thus the portal systems in every lobule are uniformly enlarged by a rarefied oedematous network of thin and thick collagen fibres and moderately numerous, rather slender fibroblasts. They are infiltrated with numerous lymphocytes, remarkably numerous neutrophil

leucocytes, a few round and spindle macrophages full of bile pigment, and a few plasma cells. There is considerably less inflammatory infiltration in the large portal systems than in the small. This infiltration has spread between the liver cells of the periphery of the lobules. These inflamed fibrotic portal systems contain numerous regenerated pseudo-bile canaliculi, which seem to have budded out from the liver cells; they contain much bile pigment, mostly in their lumina, some in the cytoplasm of their cells. The fibrosis is unilobular. There has been no nodular regeneration of liver cells to disturb the normal lobular pattern. Regeneration of single cells is indicated by the presence of two nuclei in some cells. There is albuminous degeneration and vacuolation of liver cells, and the nuclei of many show karyolysis. In one group of liver cells vacuolation is conspicuous. In the absence of frozen sections the presence of fat cannot be determined. In the centres of the lobules there is slight inflammatory infiltration. There is much bile pigment in the liver cells, and large bile thrombi are numerous in the bile capillaries. The bile ducts in the small and large portal systems are not dilated and are empty except for a very little coagulum in one of the larger ducts. All arteries and veins are normal."

The patient recovered from the immediate effects of the operation, and some two weeks later was able to get up and walk about. However, he subsequently relapsed, and increasing debility and progressive emaciation necessitated his return to bed. Jaundice steadily increased, and ascites developed so that regular paracentesis had to be employed to relieve the abdominal distension. Death occurred about 2 months after the laparotomy.

Comment on Cases I and II

Clinical jaundice readily suggests the three most frequent groups of cases characterized by this arresting symptom, and attempts were made to assign the patients to their particular category: (*a*) catarrhal jaundice; (*b*) the effects of cholelithiasis; and (*c*) malignant obstruction of the extrahepatic biliary channel. In both of the above cases an erroneous pre-operative diagnosis was made, but material removed at laparotomy led to the diagnosis of subacute hepatitis from the pathological laboratory. The term "hepatitis" suggests vagueness of diagnosis, since it may include all the results of damage to the liver, chemical or physical, or due to the action of micro-organisms and their toxic products. It might also include the various processes of reaction and repair which follow the injury. Unfortunately, in these two cases the precise cause of the hepatitis is still wanting.

It must be most exceptional in a case of hepatitis to have the onset of the disease heralded by symptoms of such severity as to suggest gall-stone colic. The persistence of the jaundice which followed the last attack of severe pain in Case I seemed to demand surgical investigation and some operative effort to relieve the obstruction. The absence of any gross obstruction along the course of the extrahepatic ducts occasioned the greatest surprise.

The pathological diagnosis of a hepatitis suggests some relationship to so-called "catarrhal jaundice," in which severe pain certainly never occurs. Doubtless both conditions are due to an infective agent, and recent investigation into the cause of catarrhal jaundice tends to demonstrate the infectivity of the disease and its possible spread by droplet infection (Newman, *British Medical Journal*, 1942, **1**, 61): many cases have been found in a locality among individuals living together or spending their lives in fairly close contact, but in our case the officer was certain there had been no similar cases among his colleagues. He gave no history suggestive of gastro-duodenal catarrh as the early pathology of the condition. The pathological findings are of unusual interest because of the rare occurrence of a biopsy of liver tissue in this disease and because of the severe degeneration of the liver cells seen in section, amounting in some areas to a complete atrophy.

In Case II the absence of pain, the increasing jaundice, and the emaciation suggested the possibility of a neoplasm, and an exploratory laparotomy seemed to be indicated. The fibrotic changes and scarring in the liver seen at operation raised the question of a syphilitic infection, but serological tests negatived this suggestion. The spleen was only slightly enlarged, and detached blood examination excluded any of those blood dyscrasias associated with gross splenic and hepatic enlargement with cirrhosis. The whole pathological process was intrahepatic; and the hepatitis was considered to be toxic in origin, the identity of the actual toxin remaining obscure. The patient had volunteered the information of his exposure to acetylene fumes while asleep in his cabin, adding how listless and unrefreshed he felt in the morning. However, no reference in the literature could be discovered relating to acetylene as producing hepatitis with jaundice; but whatever the toxin was, its virulence was demonstrated by the unfavourable course of the illness and its fatal termination.

Case III. Jaundice due to a Mass of Lymphadenomatous Glands compressing Main Bile Channel. A Case of Hodgkin's Disease, Rapidly Fatal

An officer aged 27 was admitted to hospital in March, 1942, with a history of increasing jaundice of about 10 weeks' duration. He complained of loss of appetite, constipation, and general debility; about 7 days later jaundice appeared, and he was treated by a light fat-free diet, glucose, and abundant fluids. No improvement took place, and 6 weeks later an indefinite swelling, thought to be a distended gall-bladder, was felt in the right hypochondrium. A straight radiograph showed a vague opaque shadow which suggested a gall-stone. Further facts were now elicited. At no time had he any pain—only a feeling of intermittent discomfort in the abdomen; there was no history of digestive trouble, and no similar cases had occurred among his colleagues. He was losing weight rapidly. Early in 1940 he had suffered from pleurisy, but his recovery was apparently complete, and full investigation had suggested no possibility of persistent tuberculous infection.

When admitted to hospital he was deeply jaundiced and emaciated. The liver was slightly enlarged and could be felt beneath the costal margin, but a movable swelling was now easily felt in the right hypochondrium, extending down to the right iliac fossa, and not continuous with the liver margin; this appeared to be a distended gall-bladder. Neither the kidneys nor spleen were palpable. One rather large discrete solitary gland was felt in the right supraclavicular fossa; this was not tender, and was not attached to the skin or deeper structures. No glands were palpable in the axillae; and those in the groin were within normal limits. No abnormality was detected per rectum. Almost the whole of the body was covered by a diffuse rash, produced by constant scratching due to the intractable itchiness of the skin. The urine showed no abnormality except bile salts and pigment and a faint trace of albumin. R.B.C., 4,050,000; Hb, 80% (Haldane); C.I., 0.9; leucocytes 7,000—polymorphs 65%, lymphocytes 20%, large mononuclears 4%, eosinophils 1%, mast cells 0. Wassermann reaction negative. A direct van den Bergh gave an immediate positive reaction; quantitative indirect, 20 mg. (40 van den Bergh units) per 100 c.cm.

A second straight radiograph a week after admission showed a shadow to the right of the ascending aorta in an antero-posterior view of the chest. The cervical gland enlargement was considered to be either secondary to some intra-abdominal neoplasm or, alternatively, of lymphadenomatous nature. The biopsy pathological report was provided by Dr. I. Doniach, pathologist to Mount Vernon Hospital, who reported: "The architecture of the gland is destroyed by a reticulum-cell hyperplasia. Scattered throughout are numerous giant cells of the Dorothy Reed type, together with a good number of lymphocytes, eosinophils, and plasma cells. The cells have laid down only a moderate amount of collagen. Fairly numerous mitotic figures were observed. The picture is typical of Hodgkin's disease." Within a month the patient's condition was miserable in the extreme. The pruritus had become much worse, and sleep was impossible without large doses of sedative, morphine frequently being necessary. Although the prognosis appeared hopeless, and further blood counts showed a progressive anaemia, it was considered desirable to perform a cholecyst-gastrostomy in an attempt to relieve the pruritus.

At operation, on April 4, the gall-bladder was greatly distended, and rather more than half a pint of fluid was aspirated before the anastomosis was done. Examination of the fluid revealed no bile pigment and only a trace of bile salts; cholesterol was found in the merest trace. A large mass of glands was felt in the portal fissure and along the common bile duct. The spleen was enlarged to about twice normal. The anastomosis was rapidly completed and the abdomen closed. The patient failed to rally from the operation and died the following day.

At the time of the patient's admission to hospital the diagnosis was fraught with less difficulty than that which obtained at the onset of the illness. The progressive painless jaundice associated with an enlarged liver, the considerable distension of the gall-bladder, the enlarged gland in the right supraclavicular fossa, and the gradual emaciation strongly

suggested a sinister cause of bile-duct obstruction. The biopsy proved the cervical gland to be lymphadenomatous, and the laparotomy deemed necessary by the severe pruritus gave evidence of the rare nature of the obstruction to the main bile channel.

There are certain unusual features about this case. Death indirectly due to cholaemia from obstruction to the main extrahepatic bile channel by a mass of lymphadenomatous glands is exceptional, although Rolleston and McNee do make reference to the possibility of compression of the chief bile channel by such a mechanism. These authors note that jaundice is infrequent in lymphadenoma, but allude to possible glandular compression of the common duct; they also mention two cases of periodic jaundice in Hodgkin's disease, the jaundice coinciding with fever and enlargement of superficial lymphatic glands. In Hodgkin's disease it is most exceptional for the clinical picture to be dominated by obstructive jaundice and its consequences; the rapidity with which these hastened the fatal ending of the case contrasts with the natural history of the malady: in 15 weeks from the first symptom the disease had proved fatal. The case presented other atypical features: the lymphatic glandular involvement was far less widespread than usual; one discrete enlarged lymphatic gland palpable on the right side of the neck, and the existence of a possible second in the posterior mediastinum demonstrated by radiograph, constituted the only evidence of the disease. The operation performed to relieve the pruritus enabled us to discover a glandular mass in the portal fissure which had produced the jaundice; further, the lymphatic involvement was more or less confined to those glands. It will be recalled that this patient was investigated after pleurisy some 18 months previously, and although no evidence of active tuberculous disease was found, the theory of the possibility of a coexistence of the two maladies or even of their causal relationship is revived.

Case IV. Calcified Mass embedded in Head of Pancreas compressing Lower End of Common Bile Duct: Removal: Recovery

A stoker aged 49 was admitted to a Naval hospital with 4 months' painless jaundice. An enlarged liver and a distended gall-bladder suggested a growth obstruction of the choledochus. A two-stage operation was done after taking pre-operative measures. At the preliminary cholecyst-gastrostomy a firm lump could be felt near the lower end of the common bile duct, and the pre-operative diagnosis of an "ampullary carcinoma" seemed to be confirmed. At the second operation the mass was found embedded in the head of the pancreas, and was removed with some adjacent pancreatic tissue by a retroduodenal approach. The choledochus was seen to be compressed but not infiltrated, and was not injured during removal of the "tumour."

The pathological material proved to be a mass of agminated calcified tuberculous glands. Surgeon Rear-Admiral Gordon-Taylor, who operated on the case and recently reported it, remarks: "There was perhaps some justification for the mistake in diagnosis, but at least the patient is to be congratulated on the pathological nature of the compressing mechanism, which before this experience I might have seriously doubted."

Summary

Four cases of jaundice have been described in which a diagnosis based on careful clinical examination, reinforced by laboratory and other investigations, was proved by operation to be inaccurate. The experience and knowledge to be gained from them appear to act as a deterrent, and to justify restraint on the practitioner who feels confident in his capacity to assign correctly to a particular category any case of jaundice on clinical grounds alone. The descriptions given above demonstrate that although the cases had not a few features in common, nevertheless the exact pathological detail obtained as the result of operation proved that the morbid process varied greatly. Specific infectivity, toxicity, granulomatous disease, could all be considered in the course of diagnosis. It is also worthy of note that despite our surprise in being able to exclude malignant neoplasm on three occasions (Cases II, III, and IV), yet in two of these (Cases II and III) the disease ran a fatal course in a comparatively short period. Case IV claims special mention in being apparently illustrative of its author's hope that palliative treatment for neoplasms in the region of the pancreatic head may sometimes be replaced by radical surgery, offering a reasonable prospect of cure.

I wish to express my thanks to the medical officer in charge of this hospital for permission to publish this communication and for the facilities which he constantly offered me in the collection of case details. My acknowledgments are also due to Dr. W. W. Woods, Consulting Pathologist to the Navy, and to Dr. I. Doniach for the pathological reports.

DEFICIENCY DISEASE AND ACADEMIC EVIDENCES OF SUBNORMAL VITAMIN METABOLISM

BY

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The present war with its food restrictions and black-out conditions inevitably focused attention on vitamins throughout Great Britain. Interest in the essential food factors, which was extensive before the war, flared up in both academic and trade circles. Eventually, through the media of the medical and general press and official and unofficial propaganda by circular, screen, and air, the public and the profession became almost hysterically vitamin-minded.

In certain directions there was a complete loss of perspective, incompatible with an emergency which demands a realistic view of the practical issues at the fighting fronts over-seas, and conservation of academic energy at home for more essential problems. In fact, the cult of vitamin deficiency both here and in the U.S.A. has become in part a racket. This state of affairs is largely due to the premature booming of experimental observations, and the attempt to fit them into the jigsaw of human physiology, psychology, or pathology as the case may be. The clinician is not blameless. He lends support to the situation by the empirical use of proprietary vitamin products in all manner of affections and in acclaiming their value by *post hoc* argument. However important the study of vitamin deficiency, the application of academic findings to the maintenance of fighting efficiency should be discussed at a level compatible with total war. Such discussions can hardly be conducted in perspective by those who have no first-hand experience of the clinical aspects of the vitamin deficiency disease syndromes as they exist in man and of the conditions appertaining at the various fronts. Yet just now probably more attention is given to theoretical considerations in this connexion, both here and in the U.S.A., where the clinical picture of frank vitamin deficiency disease as it appears in man is familiar to few, than in parts of the world—such as China, Russia, India, Africa, and Japan—where the human manifestations constitute a familiar everyday problem, the practical economic importance of which is great but subordinate to more urgent issues.

General statements such as these demand at least some support. Let us take the case of night-blindness in vitamin A deficiency.

Vitamin A Deficiency and Night-blindness

Night-blindness, better referred to for psychological reasons as "hemeralopia," is a prominent symptom of A-deficiency disease. It is the only subjective symptom until the later stages of the disease syndrome. This syndrome constitutes an important ever-present economic health problem in large population groups in various parts of the world, such as in the above-mentioned countries.

Frank predominant vitamin A deficiency disease is common in the Madras Presidency, which has a population bigger than that of England and Wales. Its manifestations differ in children and adults or, as Frazier and Hu (1934) have suggested, in the pre- and post-puberty periods. I have for years urged that it is the greatest cause of preventable blindness in children in South India on account of the associated corneal metaplasia or keratomalacia (Wright, 1931, 1937). The latter term is commonly used for convenience throughout the Far East for the whole syndrome, which emphasizes the importance of this complication. The most common sign, and possibly the earliest clinical evidence, of this syndrome is smokiness of the conjunctiva. This is my own view, and might possibly be disputed by such experienced clinical observers as Frazier or Pillat. I formerly held that night-blindness was the earliest evidence of keratomalacia (Wright, 1934). This conjunctival sign is unrecognized or not considered worthy of mention by those who discuss the effects of vitamin A deficiency in this country, probably because few of them have ever seen the disease as it exists in man. Kirkpatrick (1936) mentions it. It is well recognized in China (Mu *et al.*, 1937). It is not referred to by Nicholls (1938) of Ceylon: this is hardly because he does

not recognize it, as it has been known to medical men in his part of the world for years, but because both he and Aykroyd—in South India—have found it more convenient to use "phrynoderma" (pilosebaceous hyperkeratosis) in their surveys. Among children of the poorer classes Aykroyd and Rajagopal report a frequency of phrynoderma of 14% for certain groups in South India. Smokiness of the conjunctiva would probably give a higher frequency and might well be a better index. There are in the museum of the London School of Tropical Medicine water-colour pictures of this condition which I had copied years ago from some of my pictures in the museum of the Government Ophthalmic Hospital, Madras: these give an idea of its appearance. Whether this sign or the symptom of night-blindness is the earliest or most common manifestation of A-deficiency is beside the point. We have no adequate frequency figures for either to guide us. Chou (1930) has reported normal dark-adaptation in 7 out of 20 patients with early ocular signs (pigmentation) of vitamin A deficiency. The important thing for purposes of this communication is that either may be absent in cases which are otherwise clinical examples of frank predominant A-deficiency. This fact as regards the symptom is sufficient in itself to show what a false emphasis has been placed on the connexion between vitamin A metabolism and variations in night-vision here since the war began.

In discussing experimental photometric methods employed to demonstrate a correlation between defects of dark-adaptation and the so-called subclinical A-deficiency, Frazier and Li (1938) quote Jung (1938) on the applicability of the fallacy of centripetal drift to the conclusions from such observations. They say: "It would seem, therefore, that a more critical evaluation of the results of photometric testing is required before final conclusions can be drawn on either the incidence of subclinical forms of vitamin A deficiency or the effect of therapeutic measures on the results of such tests. For the present, at least, evaluation of specific treatment in human cases should depend upon observations on definite clinical manifestations such as straightforward night-blindness, xerophthalmia, and follicular hyperkeratosis of the skin." This criticism seems as pertinent to-day as in 1938, and the application of Jung's ideas on poor dark-adaptation to recent work in this country would probably show that in "conditions influenced by so many uncontrolled variables the readings are completely determined by chance."

Again, this night-blindness does not constitute a labour problem in South India, where A-deficiency is so prevalent. It does not interfere with night work to any extent. I have rejected more candidates for specialized night employment, which required a simple night-vision test, on account of tapeto-retinal degenerations, of which retinitis pigmentosa is chief, than for the hemeralopia of A-deficiency. In either case the figure is so small as to be insignificant. Night-blindness, too, does not prevent such jungle tribesmen as the Sholagas of South India moving rapidly and safely through dangerous country on the darkest nights. I have followed such men, some of whom showed evidences of A-deficiency, in the dark with difficulty.

If a case of A-deficiency disease with well-marked night-blindness in a Tamil received the average daily ration of the British soldier in England once a week, I should expect recovery. The authorities here at home would shudder at the thought of maintaining the British soldier on a diet which in hospitals of South India or parts of China or Japan would be considered adequate to keep the individual free from hemeralopia. As I have indicated elsewhere (Wright, 1935-6), I cannot imagine there being any such thing as a practical vitamin A deficiency disease problem in this country or America on diets short of famine diets.

With regard to the anti-infective role of vitamin A—which may yet have a revival in connexion with the home Forces—I agree entirely with Pillat (1929) that ordinarily the pathogens grow as saprophytes in the metaplastic tissues of vitamin A deficiency disease; and with Kirkpatrick (personal communication), who holds that colliquative necrosis is the primary process which produces corneal ulceration, not an invasion by pyogenic organisms. My experience coincides with that of Frazier and Hu (1936), that an increased susceptibility of the skin to "boils, sores, impetigo, napkin rash, or other evidence of skin sepsis" is not a clinical feature in keratomalacic subjects. Skin rashes other than pityriasis pilaris (pilosebaceous hyperkeratosis) are not more common in the keratomalacic population of Madras than in the general hospital population (Nayndu, 1935).

Evidently the condition in man cannot be gauged from observations on animals so far as practical clinical issues are concerned. If they were even approximately parallel, an increased frequency of stone in the bladder might be assumed to exist in South India by those in this country interested in vitamins but without experience of the A-deficiency disease syndrome in man. To find an increased frequency of stone in India one must look in parts of the North, where vitamin A deficiency disease is hardly known.

Night-vision in the Army

Before assuming, on theoretical academic considerations or animal (and human) experiments, that minor degrees of A-deficiency affect in any practical way whatever the military value of our man-power in this country, it is essential to consider the effects of gross A-deficiency on the physical activities of members of those populations largely afflicted with vitamin A deficiency disease. Apparently night-blindness has not interfered with the rapid night movements of Japanese troops through the Malayan jungles, although prima facie one might expect it to be a more practical difficulty in their case. Undoubtedly we have a night-vision problem here now. Modern methods of war have enhanced the value of good night vision and thrown poor dark-adaptation into prominence.

For convenience we may consider poor dark-adaptation as of three types—psychogenic, pathogenic, and physiogenic.

Psychological disturbances are a frequent and serious cause of poor night-vision in the Army, as pointed out last year in these columns (Wittkower *et al.*). This form of psychoneurosis received a considerable impetus from the ill-advised publicity campaign in connexion with the beneficial effects of vitamin A on night-vision. The evil effects of this campaign are enormous; the term "night-blindness" has attained a suggestion-value analogous to that of "shell-shock" in the last war.

Bad night-vision associated with well-known recognizable pathological ocular conditions is infrequent and of lesser moment. In this *pathogenic* group the night-blindness of vitamin A deficiency would find a place if it existed here. In the *physiogenic* group poor night-vision may be regarded as a variation in dark-adaptation at one end of the physiological curve. That this function is influenced by many factors, individual and racial, is known. Its investigation is essential in connexion with certain activities of the fighting Forces, and is having the serious attention of the medical authorities. It is not a vitamin A problem, and will not be solved by "following the carrot."

Vitamins B and C

Criticism in like manner is applicable to recent activities in connexion with B complex and vitamin C. To assess deficiency in B_2 (riboflavin) mainly by means of minor variations in the capillary loops at the corneal margin—which are, to say the least of it, common to a number of causes—is futile in wartime. Yet Sydenstricker *et al.* (1940) seriously advocate such capillary changes as the main prop in a list of clinical criteria.

Among ophthalmologists familiar with corneal bio-microscopy since its inception, who is to say what are the capillary variations at the limbus within normal limits? Does the capillary invasion which is suggested as a criterion exceed that which is determined by dust, wind, weather, and other irritants associated with military activities? When a vitamin deficiency can be assessed quantitatively by chemical means, and a biochemical (subclinical?) abnormality established, it may be justifiable in wartime to subject large numbers of hard-worked officers and men to detailed examinations—provided competent clinical, public health, and pathological opinion can show a probable case for impairment of military efficiency on metabolic grounds. Even here a practical rather than an academic level should be adopted.

The processes of biological oxidation (cell respiration) with which the vitamins are eventually concerned are interdependent and overlap, just as the clinical evidences of deficiency overlap. This fact necessarily leads to important abstruse fields of

chemical inquiry. Such investigations, and mass biochemical observations, especially on children, will no doubt afford information which may be of use in post-war reconstruction: This war has still to be won by, for the most part, adults to whom the application of metabolic hypotheses is hardly of military value, as they must fight now under dietetic conditions largely imposed by the enemy.

Finally, in this matter of vitamins as applied to the supply of man-power in a grave emergency here and in the U.S.A., it is out of perspective and unrealistic to spend time, money, and energy by labouring academic findings when at least the younger observers may get in touch with practical issues by looking further afield and seeing the real thing in greater mass as it exists in man under conditions of total war over-seas.

REFERENCES

Chou, C. H. (1930). *Nat. med. J. China*, **16**, 365.
Frazier, C. N., and Hu, C. (1934). *Trans. 9th Congr. Far East Ass trop. Med.*, **1**, 461.
— —— (1936). *Arch. Derm. Syph.*, **33**, 825.
— and Li, H. C. (1938). *Chin. med. J.*, **54**, 301.
Jung, F. T. (1938). *Science*, **87**, 461.
Kirkpatrick, H. (1936). *Diseases of the Eye*, Calcutta.
Mu, J. W., Frazier, C. N., and Pillat, A. (1937). *Chin. J. Physiol.*, **11**, 247.
Nayndu, G. J. (1935). *Proc. All-Ind. ophthal. Soc.*, **4**, 68.
Nicholls, L. (1938). *Tropical Nutrition*, London.
Pillat, A. (1929). *Chin. med. J.*, **43**, 907.
Sydenstricker, V. P., Sebrell, W. H., Cleckley, H. M., and Kruse, H. D. (1940). *J. Amer. med. Ass.*, **114**, 2437.
Wittkower, E., Rodger, T. F., Scott, G. I., and Semeonoff, B. (1941). *British Medical Journal*, **2**, 571, 607.
Wright, R. E. (1931). *Lancet*, **1**, 800.
— (1934). Elzb. Matthai Lects. 1933–4, *J. Madr. Univ.*
— (1935–6). *Trans. west. ophthal. Soc.*, 106.
— (1937). *Trans. 15th int. ophthal. Congr.*, Egypt, **5**, 79.

Medical Memoranda

A Case of Haemorrhagic Measles

While it is generally agreed that haemorrhage occurring into a measles rash is not uncommon, true haemorrhagic measles is so rare that well-known writers on infectious diseases such as Goodall and Ker state that they have never seen a case. It is thought that the more frequent reference to it by the older writers was due to its confusion with haemorrhagic small-pox. For this reason I think that the following case, though not quite typical, is worthy of publication.

The patient, a male child of 12 months, was seen at home on June 9, 1942, by Dr. Myerhoff, who considered the appearance to be typical of measles in the eruptive stage. The rash had started on the previous day. On the 12th the child became very ill and was admitted to Clayponds Isolation Hospital as a case of measles complicated by bronchopneumonia.

On admission the child, who was of normal nutrition and development, was seen to be very collapsed and dyspnoeic. The rash had completely disappeared. Although dyspnoea and cyanosis were severe—respiration rate 70—the chest was free from abnormal physical signs. The patient's condition at this stage would seem to correspond with the suffocative type of measles described by Rolleston and Ronaldson. The child was given 0.5 g. of sulphapyridine 4-hourly, continuous nasal oxygen, and frequent glucose drinks. About 4 hours after admission extensive haemorrhages into and under the skin of the face and limbs suddenly began to develop. One large haemorrhagic area, involving the greater part of the nose and adjoining skin, had a raised bullous appearance. No bleeding occurred from the mucous membranes, and the skin haemorrhages had reached their maximum extent in the course of a few hours. Subsequently the general condition of the child began to improve, but he remained very ill, with an irregular remittent temperature, for a further nine days. Sulphapyridine was discontinued on June 16 and no further complications occurred. Subsequent convalescence was rapid, and the patient was discharged from hospital on July 1. The haemorrhagic appearance had by then completely disappeared except for the presence of a scab on the bridge of the nose, where a large haemorrhagic bulla had resulted in superficial ulceration.

This case appeared to correspond with the description of true haemorrhagic measles in that there was a rapid recession of the rash followed by haemorrhagic extravasation. It differed in the absence of haemorrhages from the mucous membranes and in its ultimate recovery.

I am grateful to Dr. Thomas Orr, medical officer of health for Ealing, for permission to publish this case.

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Reviews

PAIN AND ITS MECHANISM

Pain. By Sir Thomas Lewis, M.D., F.R.S. (Pp. 192; 27 figs. 12s. 6d.) New York and London: The Macmillan Company. 1942.

Bacon wrote of books, "Some are to be read only in parts; others to be read but not curiously, and some few to be read wholly and with diligence and attention." Sir Thomas Lewis's *Pain* belongs to the third category. As a clear, exhaustive, and critical exposition it is a worthy successor to *The Mechanism and Graphic Registration of the Heart Beat and Blood Vessels of the Human Skin and their Responses*; while its content will appeal to the wider audience of practitioners and students already familiar with *Diseases of the Heart* and *Vascular Disorders of the Limbs*. The scope of the book can be gathered from two extracts from the preface:

"The chief purpose of this book is to review modern ideas of the mechanism of human pain and to bring into perspective with other observations the work of my own laboratory during the last ten years. While attempting to make a book of reference, one that will bring contact with the more important views, I have desired to . . . keep it in a readable form that will stimulate interest and enquiry."

"Our knowledge of pain, of its sources, of the nerve paths conveying it, has been built up, and will continue to be built up, chiefly by observations upon man. It is built up by tests of the sentient surface in the normal subject, tests of skin deprived deliberately or accidentally of its nerves, the innumerable probings of disease itself, stimulation of deep-lying structures during surgical operations, and ingenious forms of exploration of deep structure from without; all these sources have contributed so abundantly that I shall but rarely need to refer to evidence derived from animals. There is manifest wisdom in seeking knowledge from the direct, rather than from the indirect, source, and here the direct source is prolific; there is, too, the deep satisfaction of knowing that any evidence won from man is indubitably applicable to the human problem."

After reviewing the sensitivity of various human tissues to pain and the nervous paths subserving it, the author proceeds to unfold, against the background of earlier knowledge, the newer developments resulting from his own work and that of his laboratory. This begins with the demonstration that in respect to quality there are but two distinct kinds of pain, that arising from skin and that arising from deeper structures. Dealing first with skin pain the author describes the condition "erythralgia," in which the skin some hours after being injured by a variety of stimuli becomes red and tender. An analysis of this condition leads to the conclusion that the hyperalgesic skin "is one which has been brought to this state by the action of certain tissue substances upon the pain nerve-endings, the latter being rendered hyper-excitable." The next chapter analyses the diffuse hyperalgesia which follows a few minutes after a small localized severe injury to the skin and which may last for 8 to 12 hours or as long as two days. An experimental analysis shows that this hyperalgesia is due to an axon reflex arising from the point of injury and spreading to the limits of the area involved, where the effector endings release in the skin substances increasing the excitability of the pain nerves. Since this axon reflex implies unusually long axonic branchings, and since the effector release of substances lowering the pain threshold cannot be ascribed to any known system of nerves, the author has postulated that besides the known sensory and motor nerves to the skin there exists another system, for which he has proposed the name "nocifensor nerves." The evidence for the existence of such special nerves is strong; it still lacks anatomical demonstration.

From the point of view of medical practice, the most significant part of the book is probably that dealing with deep pain and the associated phenomena of muscular tenderness and rigidity. Lewis and his pupil Kellgren have shown that not only is pain from a deep somatic structure indistinguishable in quality from the pain of visceral disease, but it is likewise referred to a distance in a segmental fashion, and is also accompanied by muscular tenderness and rigidity. This demonstration provides the basis for a review of the pain and associated phenomena of visceral disease. The controversy as to whether the source of pain and the associated reflexes

in visceral disease is the viscus itself or adjacent structures is summed up as follows:

"It is not fundamental unsoundness that renders either the first or second view unacceptable since each contains a large element of truth; it is their presentation as general laws, each exclusive of the other, which is objectionable. I believe that referred pain and associated phenomena are started sometimes in a visceral structure (not necessarily in the actual viscus) and sometimes from the anterior or posterior wall of the body cavity. The evidence that they can so start has been given and is, I think, in both cases conclusive."

From this account of its contents the reader will appreciate that this is an important book, for pain and the associated phenomena of tenderness and muscular rigidity are the very foundation of the diagnostic art. It can be confidently recommended to medical men not only as a book which will arouse their interest but as one which ultimately cannot fail to help their understanding of disease. It is, moreover, a unique illustration of what can be achieved by a forceful mind with the simplest of apparatus and methods.

PRACTICE OF AN AMERICAN SURGICAL CLINIC

Surgical Practice of the Lahey Clinic, Boston, Massachusetts. (Pp. 897; illustrated. $10.00 or 50s.) Philadelphia and London: W. B. Saunders Company. 1942.

The Lahey Clinic, Boston, Massachusetts, is one of the best known of the large American clinics and its reputation stands high in that country. The present volume is a series of articles on the surgical practices of the clinic, which constitute, as Lahey himself says in the preface, a true cross-section of the work embracing methods, techniques, diagnostic measures, and results. The whole field of surgical enterprise is not covered, but the articles nevertheless represent a very comprehensive survey of many of the commoner branches of ordinary workaday surgical practice.

The first 140 pages are devoted to certain aspects of thyroid surgery, the most interesting features in this section being articles upon the management of intrathoracic goitres and the routine dissection and exposure of the recurrent nerves in subtotal thyroidectomy, the latter reminding one of the old adage, "If there's anything you're afraid of in a surgical operation, go for it." After shorter sections on the oesophagus, lungs, and breast, the surgery of the alimentary canal and its accessories receives a considerable amount of attention. Of many points of interest here the following may be picked out as of particular value. In the performance of the operation of total gastrectomy many surgeons from time to time must have found it advisable to remove the spleen at the same time, but here we find it advocated as a definite advance in technique, of frequent application, making the operation easier and reducing the risk. In dealing with massive haemorrhage from peptic ulcers a conservative attitude is advised except for a very small group of cases in which the bleeding seems to be beyond control; these are dealt with usually by resection, but sometimes by less drastic means of surgical haemostasis. Informative chapters discuss the treatment of Crohn's disease and of abdominal fistulae. In the technique of gall-bladder surgery the practice of the clinic is orthodox, although cholecystjejunostomy is suggested in place of the common cholecystduodenostomy or cholecyst-gastrostomy when an obstructed common duct has to be circumvented. The Lahey two-stage operation for abdomino-perineal resection of the rectum, as would be expected, is fully described. The operative mortality has been 12% and the end-results have been particularly good, over 50% of the patients being alive after a period of 6 to 10 years.

Sections on certain gynaecological conditions, orthopaedics, and neurosurgery precede the final one on anaesthesia. A good deal of space is devoted to the application of spinal anaesthesia, and an interesting account is given of the technique of continuous, or fractional, spinal anaesthesia. This is advocated especially for operations of unpredictable length—the longest case recorded being of four and a half hours' duration. We imagine that this method (devised by W. Lemmon of Philadelphia) is unlikely to replace the very satisfactory and simple methods (such as those of Etherington Wilson and Lake) now in common use, since there are obvious difficulties and risks associated with it. Few abdominal operations can possibly last longer than the two-hours anaesthesia which nupercaine in suitable strengths can give, but the new method is an interesting exploration into the possibilities of this form of anaesthesia.

The illustrations throughout are to the point and of first-rate quality. Altogether this volume can be warmly recommended, for a strong element of common sense runs through the opinions expressed, and there are few who would not gain some useful information and guidance from it.

A TEXTBOOK OF MEDICINE

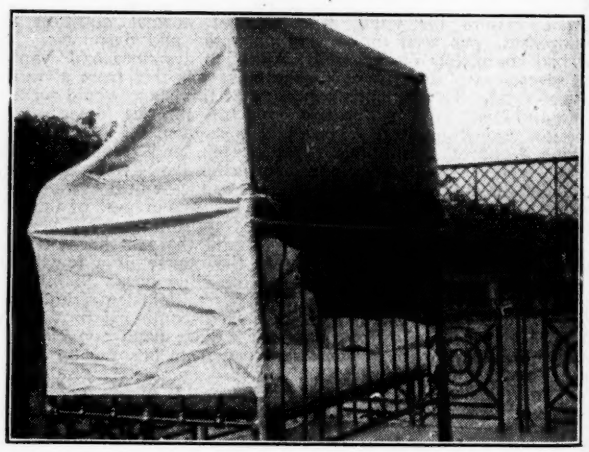
Medicine: Essentials for Practitioners and Students. By G. E. Beaumont, D.M., F.R.C.P., D.P.H. Fourth edition. (Pp. 801. 28s.) London: J. and A. Churchill. 1942.

When a textbook reaches its 4th edition in ten years its success is established and the reviewer's task is proportionately lightened. In those ten years Dr. Beaumont's experience has deepened, but also, to his dismay, the facts the student is expected to know have increased alarmingly. The mere catalogue of new features in this edition, whether new or rewritten articles or additional notes, occupies more than a page of the preface. Naturally, some in the first category relate to the effects of air raids, such as blast injury of the lungs and the crush syndrome. There is an interesting discussion under the latter heading of the parts played by intoxication of the kidney by myohaemoglobin and of the heart by potassium salts on the one hand, and, on the other, by the exaemia which results from the oedema of the compressed limb. There is also a helpful discussion of the factors in the severe jaundice of the newborn. We wish there were more such, for this work illustrates one of the present difficulties concerning students' textbooks. It seems to us that what is needed is a textbook of *principles* which will stimulate the student to do his own thinking and form his own conclusions. Given the encyclopaedic method, we do not see how the book before us could have been better done, but is it the right method? For example, the factors in uraemia, both actual and speculative, are duly stated, but there is no guidance as to their relative significance and importance. Naturally we realize that Dr. Beaumont, like the student, is the victim of an examination system which urgently calls for reconsideration.

Preparations and Appliances

BED AND COT TENTS

Dr. C. PAGET LAPAGE (Manchester) writes: The illustration shows the essential features of tents which can be readily fixed to ordinary ward cots and beds. Primarily they were made for use on the ward balcony, especially in very windy or very



sunny weather or for initiation of balcony treatment in weakly infants and convalescent children. They can, however, be used inside the ward, either to avoid draughts or for isolation purposes, though they are not necessarily ideal for the latter purpose. These tents also make it possible to give even delicate babies a daily airing, and this, to my mind, is one of the most potent measures for preventing ward infections.

The tents were made for me by Mr. Robert Burns of Hanover Mills, Buxton Street, Manchester, 1.

BRITISH MEDICAL JOURNAL
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DO DOCTORS DISAGREE ABOUT PASTEURIZATION?

Most readers of the *Journal*, we imagine, will wonder if it is necessary to ask this question. And indeed those who have, over a large number of years, followed the evidence that has been reviewed in these columns will be inclined to dismiss the question as idle and rhetorical. But unfortunately it is still necessary to ask it and to reiterate the reasons why the majority of doctors who have given a moment's thought to the matter agree that pasteurization of milk is in the interest of the public health, and to examine the views of what must be a very small minority of those who do not agree. Unfortunately pasteurization of milk is one of those subjects on which the lay and uninstructed person believes himself competent to hold views. Such people usually begin their arguments by saying: "Ah, well, doctors don't agree among themselves about this." A few medical men, too, tend to attach greater significance to their personal views than to the evidence on which such views should be based. We should have thought that the evidence presented by Prof. Selby Wilson in his recent book, *The Pasteurization of Milk*,[1] would have convinced those who are capable of assessing such evidence—and among these we would like to include all members of the medical profession. Those doctors who do not agree that pasteurization of milk is necessary for the health of the people no doubt are sincere in holding the belief they do. No doubt also there are many sincere people who still believe that the world is flat; but among the majority who accept the evidence of science such a belief is looked upon as foolish and without foundation. By pasteurization we mean, it should be clear, the freeing of milk from pathogenic micro-organisms that might infect the consumer.

The question of pasteurization was discussed by the Parliamentary and Scientific Committee of the House of Commons on October 20, and subsequently a number of M.P.s, including a medical man, Sir Henry Morris-Jones, tabled the following motion:

> "That this House, realizing the unique value of fresh milk in the national diet, asks that His Majesty's Government should not, without the fullest inquiry, embark upon a policy involving the consumption of half-boiled milk, frequently known as pasteurized milk, which is still the subject of conflicting expert opinion; and further urges His Majesty's Government to pursue with vigour a policy to eliminate cattle disease, exterminate vermin, improve water supplies, and establish higher standards of cleanliness and hygiene on the farm and in the transport and the handling of milk on its way to the consumer."[2]

Sir Henry Morris-Jones, then, apparently considers it necessary at this late time of the day to make yet another inquiry into the value of pasteurization, "which is still the subject of conflicting expert opinion." Is there really any opinion that can be called expert which is in conflict with the view that pasteurization of milk is necessary to control the incidence of milk-borne infections? At the meeting of the Parliamentary and Scientific Committee the case against pasteurization was put by Dr. A. H. Macdonald, formerly chief medical officer to Dr. Barnardo's Homes. We will give here an excerpt from the report of what Dr. Macdonald said, issued by the Committee itself:

> "Another point to bear in mind was that children brought up on tuberculin-free milk (T.T.) were liable, if for any reason they had to drink ordinary raw milk which more likely than not would contain living tubercle bacilli, to develop tuberculous glands or peritonitis. . . . In recent years tuberculosis was said to be on the increase. Dr. Macdonald was not surprised, since more pasteurized milk had been consumed. He was afraid it would continue to increase so long as this state of control lasted, and the drinking of pasteurized milk became more general."

After some further observations on the subject Dr. Macdonald concluded, according to the account we have, that "the taking of clean raw milk, and not pasteurized milk, was one of the best means to combat tuberculosis." No doubt Dr. Macdonald believes what he says, and this argument should be examined because it is one that is not infrequently used by lay people who are also quite genuine in their opposition to the pasteurization of milk. What Dr. Macdonald is saying in effect is that, in order to offer a person protection against tuberculosis, children should be allowed to drink milk containing tubercle bacilli. In other words, he advocates that an oral vaccine of viable and virulent bacteria should be given in unmeasured doses at unstated intervals. There is surely no need in these columns to bring arguments against using a vaccine in this way. There is, however, one result of this method of vaccination which is undeniable, and that is that owing to the consumption of this milk at least 3,000 to 4,000 persons in this country contract bovine tuberculosis every year, and 1,500 to 2,000 die of it every year. Do those who think alike with Dr. Macdonald seriously believe that this country, if fully acquainted with these facts, would allow the medical profession to advocate a method of immunization which carries with it such a high mortality rate? Further, if it were agreed that an oral vaccine of viable bovine tubercle bacilli provided the best way to combat tuberculosis, would it not be more logical and more in keeping with what is known about the principles of immunization to give such a vaccine in accordance with these principles, rather than to leave it to the discretion of the householder to conduct this uncontrolled experiment herself?

We have picked out this one point because it formed the staple of Dr. Macdonald's opposition, and so no doubt it will be heard of again in the House of Commons and from those who, for whatever reason, share the hostility to pasteurization expressed by another speaker before the committee, Mr. David Quibell, M.P. Prof. Wilson rightly reminded those present at the committee that milk was at times responsible for spreading scarlet fever, diphtheria, enteric fever, dysentery, food-poisoning, and *Brucella abortus* infection. Pathogenic micro-organisms might come not only from the cow but also from the upper respiratory tract and from the fingers of farm workers. He reminded them, too, that another possible source of infection was sewage-polluted water used for dairy purposes, this being the origin of the milk-borne outbreak of typhoid fever in Bournemouth in 1936.

It is difficult to understand why a country which insists upon bacteriological purity of the water supply wishes to oppose the introduction of an equally pure milk supply, but at least no one has yet suggested that the public health authorities should allow typhoid bacilli to appear in the household drinking-water as a method of immunizing the susceptible population against enteric fever.

[1] *British Medical Journal*, 1942, **2**, 458.
[2] *Times*, Dec. 5, 1942.

UNDER THE ELECTRON MICROSCOPE

The microscopist, like the specialist, seeks to discover more and more about less and less. To assist him in his task he has a variety of microscopes—the compound, the dark-ground, the ultra-violet, the infra-red, the fluorescence, and, latest comer, the electron or "supermicroscope." The glass-lensed compound microscope is capable of almost any degree of magnification, but for the demonstration of minute objects as separate entities—that is, for resolution—it is limited by the wave-length of light. The development of "electron optics" by television physicists has made the construction of the electron microscope possible. An electron beam replaces the light-source of the compound microscope, and a series of electromagnets focus the beam much as glass lenses focus a beam of light. Electron waves travel in straight lines only in a vacuum. The whole microscope must therefore be evacuated to a high degree. Since the waves are entirely invisible, their images must be made visible by the use of either a fluorescent screen or a photographic plate. By using electron waves 1/100,000th of the wave-length of visible light, it may be possible to obtain a magnification of 25,000 to 100,000 with accompanying resolution. One red blood cell would thus be enlarged to seven metres. Specimens for examination are mounted on a very thin collodion film; they must be dry and extremely thin.

The electron microscope is not yet an instrument for every pathologist's bench. Its immediate future lies rather in the research laboratory. It holds great promise in almost every field of science, as it reveals many important structures and reactions which have hitherto been inaccessible to direct observation and measurement. In chemistry it has been possible to obtain micrographs of the location of certain chemical reactions incident to the metabolism of the bacterial cell. Morton and Anderson[1] have studied the reduction of tellurites by *C. diphtheriae*, and have shown that crystals of tellurium form in all parts of the micro-organism, in some cases puncturing its walls. Electron microscopy has also proved of service in metallurgy, crystallography, and colloid chemistry, and in studies of molecular architecture. Possibly a new technology of staining for electron microscopy may develop. Recently Mudd and Anderson[2] have tested a method of selective microchemical analysis, equivalent to differential staining, by photographing specimens after exposure to the salts of heavy metals. Bound up with this work there is another promising field of application of microchemical analysis: this is the recording of the action of germicidal agents on bacterial cells.

Excellent micrographs of bacteria have been obtained, particularly by Mudd, Anderson, and their colleagues.[3] They have shown that many types of bacteria, including streptococci, pneumococci, anthrax and subtilis bacilli, typhoid and coliform bacilli, possess rigid outer membranes which protect their inner protoplasm. Flagella of motile forms are extremely delicate structures, some of which appear as two parallel lines with alternate thinner and thicker markings. Flagella of monotrichates—for example, vibrios—are on the whole wider in diameter. *Treponema pallidum* appears to have a continuous envelope, a knob-like structure at one end, and flagella-like processes at various points along its course. The protoplasmic inner structure of many micro-organisms is not homogeneous. In diphtheria bacilli, for instance, definite polar bodies are seen, and in tubercle bacilli areas of greater and lesser density are observed. Spores of subtilis bacilli appear as dense oval bodies.

In histological research the electron microscope has revealed characteristic cross-striations in collagen fibres, and the effect of various physical and chemical conditions on the fibres is being investigated by Hall, Jakus, and Schmitt[4] in a search for further knowledge of the molecular structure of collagen. To entomologists the new instrument discloses hitherto unseen structures and it permits the accurate measurement of those already recognized. The tracheae, trachioles, air sacs, wing scales, and cuticle have been studied, and experiments by Richards and Anderson[5] on the mode of penetration of the cuticle by non-volatile oils serve as an example of future useful applications.

The electron microscope may well show its greatest value in the study of objects between 5 and 250 mμ, a range not covered by the light-microscope and the one in which nearly all viruses fall. Micrographs of individual virus particles may be secured and their sizes and shapes established with accuracy. Green, Anderson, and Smadel[6] have shown that elementary bodies of vaccinia are rectangular in shape, resembling a brick, and contain five areas of condensation arranged somewhat like the five spots on a dice. Particles of tobacco mosaic virus appear in purified preparations as discrete rod-like units with a tendency to side-to-side and end-to-end aggregation. Bacteriophages, studied by Luria and Anderson,[7] disclose an extremely constant and characteristic sperm-like appearance with a round head and a much thinner tail; in many micrographs the head is filled with a dense internal structure. Such particles are adsorbed to their specific micro-organisms by head or tail, and after contact it is possible to see extensive damage to the bacterial cell. The discovery of such constant and detailed differentiation in objects of supposedly macromolecular nature is of interest also to geneticists, for genes, as well as viruses, are thought to be macromolecular entities. Sperms of the ram and the bull, owing to their extreme flatness, are amenable to examination and have already come under observation.

Finally it should be mentioned that the interpretation of results is limited at present by the necessity for placing the specimen for study in a high vacuum; by the inability to assess the changes effected in protoplasm and in molecules by the electron bombardment; and by the extreme thinness of the objects which the electron beam can traverse. Entomologists have commented on shrinkage, evolution of gas, discoloration, and increased friability of their specimens. The electron microscope is, however, in its early days, and some, if not all, of these difficulties are likely to be overcome by teams of physicists, chemists, and biologists, such as those already working for the National Research Council and the Radio Corporation of America.

CHARTING THE PULSE

The commonest type of clinical chart is still that which provides a graphic record only of the temperature, and relegates pulse and respiration rates to a cramped space at the foot, where they appear in figures. The careful perusal of these figures is no substitute for the instantly comprehensible picture given by charting all three graphically; significant tendencies then become evident at a glance, and the warning of some change in the patient's condition stares one in the face instead of having to be deduced laboriously by building up a mental picture from numerical data. The pulse rate can in some circumstances mean more than the temperature, and is equally entitled to display in the same form; in morbus cordis, for example, it may be the only feature in the chart showing significant

1 *Proc. Soc. exp. Biol.*, N.Y., 1941, **46**, 272.
2 *J. exp. Med.*, 1942, **76**, 103.
3 *Arch. Pathol.*, 1942, **34**, 199.
4 *J. Amer. chem. Soc.*, 1942, **64**, 1234.
5 *J. Morph.*, 1942, **71**, 135.
6 *J. exp. Med.*, 1942, **75**, 651.
7 *Proc. nat. Acad. Sci.*, 1942, **28**, 127.

variation. A falling temperature, in itself a usually favourable sign, assumes a quite different complexion in the presence of a steadily rising pulse rate, and the opposite tendencies of their two graphs afford an unmistakable danger signal. The evil obscurity of the ordinary chart had a hand in a fatality recorded by Joan M. Boissard and R. M. Fry[1] which also raises some other points of interest in diagnosis. A boy aged 12 fell 40 feet, fracturing both forearms and sustaining ruptures of the liver and right kidney; these were dealt with by suture and nephrectomy respectively. Reduction of the fractures under anaesthesia was not undertaken until some days later, when the general condition had improved. Both operations were followed by febrile exacerbations, and there is consequently little contrast between the temperature chart in the early stages and its behaviour after the twelfth day, which was the time of onset of a haemolytic streptococcal peritonitis due to a ward infection. The pulse, on the other hand, which had previously fallen and remained steady for several days, showed a continued rise, which is striking as seen in graphic form in this report, but was recorded on the patient's chart only in figures. When the abdomen was first explored only a serous fluid was found, which was not sent for bacteriological examination, and it was only on the day before death that a bacteriological diagnosis was made. The exudate in this form of peritonitis is sero-fibrinous and not frankly purulent. In the early stages it may contain but few streptococci; it should preferably be collected as a fluid rather than by swabbing, if necessary by aspiration via a catheter passed down the drainage tube. The bacteriologist is well advised to cultivate a large inoculum in glucose broth as well as to make the usual plate culture.

PROPHYLAXIS OF RHEUMATIC FEVER

It is now six years since the first attempts were begun in the U.S.A. to prevent recrudescences of rheumatic fever by giving sulphanilamide continuously over long periods. For reasons which are far from clear this drug does harm rather than good during the rheumatic attack itself, but, if administration is begun when the attack is over, the further activity of haemolytic streptococci is suppressed and throat infections such as precede further exacerbations do not occur. Caroline B. Thomas,[2] who was one of the first to adopt this method, now reviews her own experiences with it at the Johns Hopkins Hospital and those reported in five other American studies. Her patients, regardless of their age, which varied from 6 to 37 years, though the majority were between 14 and 26, were given 1.0 and later 1.3 g. of sulphanilamide daily in two doses from October until June; lately some patients have taken the drug all the year round with no summer intermission. This is now thought a better plan, and it is therefore proposed that rheumatic subjects should have an uninterrupted course of treatment lasting five years or even longer in younger patients. That further attacks can so be prevented all authors are agreed: during the first four years of Thomas's study 10% of a control group had recrudescences, and of the treated group none. Since then controls have been abandoned, and two cases only have occurred in which an exacerbation developed during treatment. Repeated throat swabbing showed the presence of haemolytic streptococci in 12% of control cases and in only 4% of the treated. The effectiveness of this treatment is therefore not in doubt, but is it feasible and safe? Apparently these patients can usually be depended on to continue taking the drug indefinitely and experience no ill effects even while engaged in strenuous occupations. They need to be shepherded through the initial stages while still in hospital, and in this series only two showed intolerance which caused the treatment to be abandoned; other authors, who have used larger doses up to 3.0 g. daily, have naturally had more such cases. In no instance have any toxic effects been seen after the first few weeks of treatment, and some of these cases have been under treatment for 3, 4, or 5 years, and one for 6 years, the last 4 without intermission, owing to the occurrence of a rheumatic attack during August of the second year, when treatment had been stopped for the summer. Thomas analyses all the recorded cases of agranulocytosis due to sulphanilamide, and points out that this complication has never been observed after the fiftieth day of treatment given for any condition, and is commonest between the fourteenth and twenty-first; during prophylactic administration for rheumatic fever agranulocytosis appeared on the twenty-ninth day in the only known case which developed it. The idea that prolonged administration is dangerous must therefore be abandoned, at least as it concerns small doses. No mention is made of the possibility that streptococci exposed to these low concentrations of the drug may acquire tolerance to it, and, indeed, there is no apparent evidence that such a thing can occur in this disease, a fact which may perhaps raise some doubts about the alleged development of "drug-fast" variants of susceptible bacterial species during treatment with inadequate dosage. We must therefore conclude that this treatment is effective, feasible, and safe; not only does it prevent further cardiac damage, but it is simple and cheaper than the institutional treatment demanded by rheumatic recrudescences.

Another method of prevention which has been tried in the U.S.A. is the subject of a further report by its authors, Valentine P. Wasson and E. E. Brown[3]; this is a prolonged course of immunization with a streptococcus culture filtrate. Almost all fresh light on the aetiology of rheumatic fever gained in the past few years points to haemolytic streptococci as the major if not the sole factor concerned, and, this being so, immunization by some means should be feasible during quiescent periods. Whether the best method of achieving this has yet been found is another matter, but here at least is an alternative form of treatment which merits further investigation.

THE CONDUCTING SYSTEM OF THE HEART

In twelve and a half pages of the *British Heart Journal* for July, 1942, appear the concentrated results of extensive scientific labour of the first order. A delightful historical note by Sir Arthur Keith tells the story of the discovery of the mammalian auriculo-ventricular node by Tawara (1905), and of the mammalian sino-auricular node by himself and Flack (1906). Prof. Francis Davies carries us further. He criticizes the view of Keith and Mackenzie that the nodes and A.V. bundle of the mammal are remnants of more extensive tissues of similar structure in lower vertebrates, on the ground that the complete nodal rings found at the junction of chambers in primitive hearts are not composed of specialized tissue as in mammals, but of unspecialized cardiac muscle arranged in a spiral so that the necessary delay in transmission of the cardiac impulse is achieved. Having made this discovery in the spotted salamander, Davies's researches to date suggest a similar arrangement in fish, amphibia, and reptiles. The specialized conducting tissue of mammals therefore appears to be a neomorphic development, associated with the need for quicker conductivity in the faster-beating hearts of homoiothermal vertebrates. This conclusion is supported by the even greater development and extension of specialized conducting tissue in birds, discovered by the author and described

[1] *Mthly. Bull.*, E.P.H.L.S., Nov., 1942, p 6.
[2] *Bull. N.Y. Acad. Med.*, 1942, **18**, 508.
[3] *Amer. Heart J.*, 1942, **23**, 291.

in this article; and again by the observations of Prof. Shaner, who found that the A.V. node and bundle of the 9 mm. calf embryo appeared to grow like any other embryonic organ, and did not behave like the remnants of more extensive tissues connecting the atria and ventricles at an earlier stage of embryonic life. These discoveries, modestly recorded, are of high importance.

PRESENTATION TO MADAME MAISKY

The Anglo-Soviet Medical Council has just come to the end of its first year of life. This precocious child anticipated its birthday in an unusual way by giving a present to one of its foster-parents when it handed to Madame Maisky on November 23 the first volume of *Reviews of British War Medicine*, published in Russian. Three thousand copies of this book have been printed, and with them goes the hope of British doctors that this small contribution will be of help to our great ally. The articles have been contributed by experts in the various subjects covered, which range from the treatment of burns to the electro-encephalogram in post-traumatic states. The authors remain anonymous, which we think is a pity. A second volume is on its way.

It was particularly fitting that the presentation should have been made to Madame Maisky, as she has shown a special interest in medicine and a live sympathy with its problems. When the time comes for Russian medical men to be eased of their terrible burden we may hope to welcome here a volume setting forth their knowledge and experience.

EXTRARENAL AZOTAEMIA

Extrarenal azotaemia is a condition in which the nitrogenous constituents of the blood are increased by causes other than primary failure of the kidneys. Urea, which forms the bulk of the non-protein nitrogen, is commonly used as an index of the degree of azotaemia. It is well known that a raised blood urea occurs in a variety of conditions such as loss or deprivation of fluid, gastro-intestinal haemorrhage, alkalosis, diabetic coma, and the crush syndrome. The exact cause of the azotaemia in these conditions is sometimes obscure, and recent studies have been made on two of the conditions with a view to clarifying the subject.

It has been known for many years that in gastro-enteritis of infants a high blood urea is found in untreated cases. With a view to determining whether this is due to a functional disturbance of the kidneys Young and McCance[1] have made a series of observations on normal babies and on infants of the same age suffering from gastro-enteritis. They find that the normal renal function of infants differs in some measure from that of adults, and is intermediate between the adult type and the type which they have previously shown to occur in newborn babies. Infants have lower glomerular filtration rates and urea clearances than adults (in relation to their surface area), and both these vary with the minute volume of the urine even at normal rates of urine flow, which is not the case with adults. In other words, when the volume of urine is decreased, as in gastro-enteritis, the infantile kidney is unable to adjust its function to the altered circumstances and produce a urine sufficiently concentrated to maintain the normal excretion of urea and other substances; there is no evidence of a specific renal lesion.

Azotaemia in gastro-duodenal haemorrhage has been studied by Black,[2] who concludes that several factors help to produce the high blood urea so often found in such cases. Large quantities of nitrogen are absorbed from the blood present in the bowel; but this probably cannot wholly account for the azotaemia. Increased formation of urea may also result from increased protein breakdown in the body; this, in turn, may be caused by dehydration and tissue anoxia. Further, there is decreased elimination of urea owing to a fall in the rate of glomerular filtration in the kidney, and formation of urine is slow. In a few cases a previous state of alkalosis or dehydration may be an aggravating factor. Black holds that the degree of azotaemia in gastro-duodenal haemorrhage is of value as a guide to treatment and in estimating prognosis. Continued azotaemia is an indication for restoring blood volume by transfusion and by the administration of fluid.

[1] *Arch. Dis. Childh.*, 1942, **17**, 65.
[2] *Quart. J. Med.*, 1942, **11**, 77

DRUGS FOR MYASTHENIA GRAVIS

The use of ephedrine in myasthenia gravis was obscured by the discovery of the value of prostigmine by Walker in 1935, but since that time there have been several reports that prostigmine and ephedrine together are preferable to either alone. The physiological basis for this clinical observation was a little obscure until research in a very different field provided a possible explanation. Bülbring and Burn observed in the course of experiments on the spinal cords of dogs that, while physostigmine (eserine) potentiated the flexor reflex, prostigmine (the synthetic analogue) scarcely influenced it unless adrenaline were present. This suggested that adrenaline might perhaps influence the action of prostigmine at the neuromuscular junction in the same way. In further experiments[1] designed to test this hypothesis Bülbring and Burn used cats anaesthetized with chloralose, and prepared so that the effect of drugs on the contraction of the gastrocnemius after stimulation of the sciatic nerve might be examined. They found that at low rates of stimulation the twitch tension was augmented by adrenaline if prostigmine was injected a few minutes previously. The same phenomenon was seen after physostigmine, though the effect was smaller. At higher rates of stimulation the increased twitch tension caused by the injection of prostigmine is diminished by adrenaline; and, similarly, in muscles tetanized to fatigue the normal augmentation after injection of adrenaline is diminished by prostigmine. There are two conditions now known in which adrenaline augments the contraction of skeletal muscle—first, in fatigue (as in the Orbeli phenomenon), and, secondly, after injection of prostigmine. Bülbring and Burn suggest that adrenaline increases the height of muscle contraction by potentiating the effect of the increased amount of acetylcholine which will in both conditions be liberated at the neuromuscular junction—in the first instance owing to the more frequent stimuli, and in the second because prostigmine prevents the rapid destruction of acetylcholine. Similarly, when too much acetylcholine is formed the effect of adrenaline is again to intensify its action and bring about depression. While this hypothesis may explain all the phenomena, it was also suggested that there may be some special relation between adrenaline and prostigmine; for instance, prostigmine augments the action of adrenaline upon the blood vessels.

To return to the subject of myasthenia gravis, there is no evidence that ephedrine itself bears any such special relation to prostigmine, but it seems very probable that ephedrine will benefit patients suffering from this disease by prolonging the effect of adrenaline naturally formed in the body, either from the adrenals or at sympathetic nerve endings. This constitutes the physiological justification for the use of prostigmine and ephedrine together.

[1] *J. Physiol.* 1942, **101**, 221.

War Medicine Series

The paper printed below is based on a lecture which was one of a series recently given at the British Postgraduate Medical School, Hammersmith

SULPHONAMIDE DRUGS IN WAR

BY

L. E. H. WHITBY, C.V.O., *M.C.*, M.D., F.R.C.P.

Brigadier, R.A.M.C.(T.A.R.O.)

It may be emphasized at the outset that there is no essential difference between peace and war so far as the principles which govern the employment of the sulphonamide group of drugs are concerned. Nevertheless, certain infections become more prominent during wartime, and it is with these, particularly meningococcal and wound infections, that this paper deals.

Principles of their Use

The first principle is that the infecting organism must be sensitive to the drug employed, the three drugs more or less readily available being sulphanilamide, sulphapyridine, and sulphathiazole. The meningococcus is sensitive to all three drugs, but the flora of a wound may be so diverse that judicious selection may be required to get the optimum result. The following table gives a rough estimate of the sensitivity of common wound bacteria to sulphanilamide, sulphapyridine, and sulphathiazole, it being borne in mind that there may be considerable variation in the susceptibility of different strains. Thus there are strains of *Staph. aureus* which are sensitive to sulphathiazole but not to sulphapyridine, and vice versa; while most strains are to some degree sensitive to both.

	Sulphanilamide	Sulphapyridine	Sulphathiazole
β-haemolytic streptococcus	+++	+++	+++
Staph. aureus	0	++	++
Proteus vulgaris	++	++	++
Bact. coli	++	++	++
Ps. pyocyanea	++	++	++
Str. viridans	0	±	+
Cl. welchii	++	++	++
Vibrion septique	0	++	++
Cl. oedematiens	0	0	0

A survey of this table shows that sulphanilamide, which is cheap, readily available, and also relatively soluble, has a fair range of activity against wound bacteria, including *Cl. welchii*, the commonest gas-gangrene organism, and is therefore the drug of choice for prophylaxis in the average case, whether oral administration or local application is used, or both. On the other hand, with an established infection either sulphapyridine or sulphathiazole is indicated because of the greater range, while polyvalent gas-gangrene antitoxin should also be administered as none of these drugs has any action on *Cl. oedematiens*.

The second principle is to obtain and maintain an effective blood-stream, spinal-fluid, or local concentration, but with serious generalized infections it is essential that the administration should be four-hourly, night and day: too often the night doses are omitted, with the result that the concentration during the night hours sinks below the effective level. It is an axiom that the drug must be in solution to be effective; this is of considerable importance when making local application to wounds, and rules out the insoluble sulphapyridine. For wound application a mixture of sulphanilamide and sulphathiazole gives the greatest chance of success; and in theatres of war, where most gas gangrene has been found to be due to *Vibrion septique* or *Cl. oedmatiens* rather than *Cl. welchii*, sulphathiazole is certainly required. These drugs act best on small numbers of bacteria: this is perhaps the strongest argument for their free prophylactic use in wounds which from their site, extent, or nature are an open invitation to gas-gangrene infection.

A third principle involves the nature of the medium in which the drugs are called upon to act; certain substances completely inhibit action and must be excluded. Pus is one such substance, and it is therefore quite useless to expect the drugs to disperse a collection of laudable pus or to be at all effective when applied to a dirty and purulent wound; this, too, is a possible explanation of failure in deep-seated bony infections in which loculations of pus prohibit action. Nor can any great effect be expected from local application to a dirty, irregular, lacerated, pocket-laden wound, into many parts of which the dissolved drug cannot penetrate and in which foreign bodies, dirt, clothing, or bone provide an impenetrable shelter for implanted bacteria. These features show that the drugs are the handmaidens of surgery and not its master, and that the best results in wound-infection prophylaxis will be obtained by early combination of the two procedures.

A fourth general principle is to avoid prolonging treatment indefinitely when no clinical evidence of effect is forthcoming. What these drugs do they usually do quickly. Provided that adequate doses have been consistently administered at four-hourly intervals for a period of 7, or at most 10, days without beneficial action, no good can be expected from prolonging the course with that particular drug. The inference is that the infecting organism is insensitive. If further chemotherapy is contemplated the preparation should be changed: an early bacteriological examination is a useful check upon useless chemotherapy. As almost a converse to this principle it may be said that too early omission of the drug, especially in dangerous generalized infections, is apt to permit a relapse or an exacerbation; almost full doses should be continued for some 48 hours after the desired clinical effect has been produced.

Sources of Infection

The β-haemolytic streptococcus is introduced into a wound by human carriers and is not implanted at the time of wounding. Prophylaxis is here more a problem of hygiene than of chemotherapy. *Staph. aureus* is present in clothing and on the skin. Most other organisms are introduced by the soil. A gas-gangrene infection is implanted as spores, and the establishment of the condition is assisted by laceration of muscle, by blood clot, by the adjuvant action of aerobic bacteria, and by the presence of calcium salts. The latent period for the activation of anaerobic spores is from 5 to 12 hours, during which time, if proper surgical treatment can be given, the chance of preventing infection is good. Sometimes the infection is fulminating and is well established within a few hours. It is obvious that gas-gangrene infections will be most frequent in mobile warfare when there is unavoidable delay in obtaining surgical treatment.

Wound-infection Prophylaxis

The object of prophylactic chemotherapy is, first, to prolong the latent period before infection has become established until such time as proper surgical treatment can be obtained, and, secondly, to ensure that any residual infection after débridement shall be eliminated. If the two procedures can be combined so much the better. Oral administration is feasible in the most advanced positions in a battle zone; local application is neither so easy nor so likely to be efficient, because the wound has been neither cleaned nor trimmed. Nevertheless, the general opinion is that local application at the earliest possible moment is desirable even though efficient surgery has to be delayed: at least partial inhibition may be accomplished, and if supplies are adequate the procedure is justifiable. A second application at the time of débridement should always be made. Animal experiments have shown that local application alone does not prevent invasion of the blood stream by the β-haemolytic streptococcus; oral administration is also required in order to obtain a sufficiently high blood-stream concentration. On the other hand, local application, properly applied, is more effective in preventing the establishment of anaerobic infection than is oral administration; the anaerobes, too, are far less invasive than the β-haemolytic streptococcus, and the relatively low blood-stream concentration which local application engenders is high enough to prevent this complication. The general conclusion from animal experiment is that local application combined with small doses by mouth is necessary for efficient wound-infection prophylaxis. No exten-

sive systematic assessment has yet been made, but the clinical impression of those who have seen active service is that these measures are effective and certainly superior to the use of antiseptics such as eusol, acriflavine, and hydrogen peroxide.

Dosage in Wound-infection Prophylaxis

For local application sulphanilamide is the drug of choice unless sulphathiazole is available, in which case a mixture of two parts of the former and one of the latter should be employed. From 5 to 15 g., according to the size of the wound, should be applied as a fine powder. However numerous the wounds not more than 15 g. should be used. The application should be made as early as possible and be repeated at the time of débridement. It is necessary to keep the wound moist with a saline gauze dressing or to cover the powdered wound with a vaseline spread. This last is recommended by Mitchell, Logie, and Handley (1941), who have had extensive experience in the Middle East. These same authorities recommend 5% sulphanilamide in 80% glycerin for deep cavities and joints. The powder may be applied with an insufflator, a pepper-pot, or even a tablespoon; it should be distributed evenly and completely, if this is possible, or applied to a moist saline gauze and thrust deep into the wound when circumstances demand. A War Office Memorandum (1940) recommends for oral administration an initial dose of 1.5 g. sulphanilamide followed by 0.5 g. four-hourly for 3 or 4 days as uncrushed tablets. The sooner this is administered the better, but it is important that all doses, and the time, should be recorded on the label attached to the patient, in the same way as morphine and antitetanic serum are recorded. Mitchell, Logie, and Handley (1941) consider these doses far too small for severe cases, and recommend as much as 4 g. for an initial dose, with subsequent four-hourly doses of 1.5 g. for 4 to 6 days, night and day; they state that they have seen many die from too little sulphanilamide but none from too much. To those who have the bogy of agranulocytosis always before them these heroic doses may appear to invite disaster; there is no doubt they are the upper limit, whereas the War Office Memorandum doses are definitely cautious. There is considerable scope for clinical judgment between the two limits according to the nature of the wounds, the higher doses being used when indications suggest that gas gangrene is inevitable. Similarly, clinical judgment will sometimes suggest that an early administration of gas-gangrene antitoxin is justifiable.

Treatment of Established Wound Infection

With acute infections both oral and local treatment should be undertaken. On account of their greater range either sulphapyridine or sulphathiazole should be used for the oral doses. Oral dosage may be as much as 10 to 12 g. daily for 7 to 10 days with a severe and extensive gas-gangrene infection; antitoxin in doses of 20 to 40 c.cm. daily for 4 or 5 days is also advisable. Frankly purulent wounds need to be cleaned up before local application is made. Chronic wound infection does not demand oral therapy unless a generalized infection appears likely; all purulent material must be removed from the wound before local application is made. Excellent results have been obtained, with rapid healing, in wounds resulting from burns. Skin-grafting may be practised on a wound-bed previously sprinkled with sulphanilamide.

Meningococcal Infections

With early administration and adequate dosage bacteriostasis is complete within 12 to 24 hours. In epidemics early recognition of cases is of first importance. With unconscious patients a soluble preparation is required at the outset, but this should give place to an oral one as soon as swallowing is re-established. The soluble preparation should never be administered intrathecally, and most authorities do not advocate the giving of serum. Sulphapyridine and sulphathiazole are somewhat more effective than sulphanilamide, and sulphathiazole is preferred on account of its less nauseating reaction. A normal fluid intake should be arranged. For adults the "loading dose" is 2 to 3 g. and the maintenance dose 1½ g. four-hourly night and day for 2 to 3 days; thereafter 1 g. four-hourly for 2 days, followed by 0.5 g. four-hourly for 2 to 3 days; total dosage 40 to 50 g., according to clinical judgment. Failure to respond to this schedule of dosage usually means that the concentration in the cerebrospinal fluid has not reached the required amount of 3 to 5 mg. per 100 c.cm. When samples of spinal fluid are sent for estimation of drug content care should be taken that no traces of novocain are present in the sample, as this anaesthetic gives a colour reaction similar to that of the sulphanilamide group. Meningococcal septicaemia responds to somewhat smaller doses; the amount recommended is a loading dose of 2 g. followed by 1 g. four-hourly until 48 hours after the temperature has become normal. The meningococcal carrier has always been a problem. Modern opinion is that a bacteriological search for carriers is not worth while in view of the ease with which the infection itself can now be controlled. There is as yet no proper estimate of the value of sulphathiazole snuff in the treatment of obvious carriers; it is claimed, however, that 1 g. of sulphanilamide by mouth six-hourly for 6 days entirely clears the carrier state.

Bacillary Dysentery

Intestinal infections are a major problem in Eastern theatres of war. For the treatment of bacillary dysentery sulphaguanidine, when available, has proved of great value. This drug has the curious property of being soluble in the intestinal contents but of being poorly absorbed unless there is a grossly ulcerated surface. The dosage employed is large, amounting to as much as 20 g. a day for 5 or 6 days.

REFERENCE

Mitchell, G. A. G., Logie, N. J., and Handley, R. S. (1941). *Lancet*, 1, 713.

INJURY TO LIMBS

A ROEHAMPTON CONFERENCE

At the invitation of the Director-General of Medical Services of the Ministry of Pensions, a conference of surgeons was held at Queen Mary's Hospital, Roehampton, last September, Mr. G. R. GIRDLESTONE presiding.

Ward Demonstration

Mr. T. P. KILNER and Mr. GEORGE PERKINS opened with a demonstration of plastic and orthopaedic cases in the wards. Mr. Kilner urged that "the best dressing for a large open wound is skin," and suggested that all surgeons in charge of accident services should be given the special equipment which facilitates the cutting of large Thiersch grafts of selected thickness. He gave a most useful demonstration of cases illustrating the use of thick Thiersch, tubular, and flap grafts. Mr. Perkins first showed a patient with the moderate but disabling degree of equinovarus associated with the relative weakness of the external popliteal group of muscles after a partial sciatic recovery. These patients are much benefited by an inside iron, outside T-strap, and a toe-raising spring attached to the outer side of the sole opposite, but not distal to, the fifth metatarsal head. He then illustrated by a number of patients his belief that it is the use, as natural as possible, of the muscles surrounding the fracture which stimulates and accelerates union. He limits the extent of his plaster splints to the margin of safety, and dislikes the Böhler iron and the single stick. He likes a heel-and-toe movement, with particular attention to the active use of the toes. Crutches or two sticks with less splintage are preferred to a long plaster which makes full weight-bearing safe. He goes so far as to recommend that splintage can often be discarded, at least during the waking hours, on palpable evidence and before radiographic evidence of union.

Deranged Knee-joint

Prof. R. J. WILLAN opened a discussion on "failures following operation for derangement of the knee-joint." He stressed the value of an exact history, and the far greater value of the evidence which can be elicited by *x*-ray examination as well as by clinical examination. Once again it was made clear that the diagnosis of an internal derangement, indicating the removal of a semilunar cartilage, requires great care and much consideration. Furthermore, if this is true in civil life, a decision to operate on a soldier or a pensioner requires even greater and more deliberate judgment. Mistakes

in technique were also discussed: accuracy, adequate exposure, and haemostasis by interrupted suture being among the points considered. Finally, Prof. Willan stressed the need for a very thorough "reconditioning." The main concern of Mr. JULIAN ORD, speaking on the treatment of "minor fractures," was the tendency to keep these fractures in plaster for too long. It was apparent that in his own clinic periods of splintage were safe which others might think dangerously short. Once again the principle emerged that it is the man and his team rather than the method which makes for success. Close observation and a well-drilled staff in a fracture clinic can bring success by methods which in other hands would be dangerous.

Scaphoid Fracture

Prof. T. P. MCMURRAY—on "non-union of fractures, with special reference to the scaphoid of the wrist"—said that, in his opinion, the non-union of the scaphoid could result from missing the diagnosis, or, though not so often, from a failure to reduce a displacement. It was wrong to suppose that the fractured scaphoid was almost always just a crack without displacement. Furthermore, those in which there was displacement, and in which no reduction was accomplished, would be (*a*) less likely to unite, and (*b*) more likely to give rise to a secondary arthritis. There was a practical test of deformity which could be applied very gently and slowly when the case was first seen after the accident. If there were no deformity, and in the absence of post-traumatic swelling, a full range of movement could be accomplished, whereas the presence of deformity would limit the movement. He advocated carrying the plaster to the tip of the thumb, and said that the position of the wrist should not be in dorsiflexion but neutral. As to bone-grafting, this should be limited to delayed union in the presence of perfect reduction, but it was a great mistake to graft a scaphoid where there was malposition of the fragments, whether or no secondary osteo-arthritis had already occurred. Then there was the question of late ununited wrist fractures in which the bone appeared as if it were congenitally bipartite. This condition would not, *per se*, be responsible for pain or for disability. It was possible that the joint might be a little more sensitive to a sprain, but the essential thing was that after *x*-ray examination had disclosed the old fracture the injury should be treated as a sprain and nothing more. On the other hand arthritis might have developed and a sprain or continued occupational strain aggravate and so call attention to the arthritis. In the presence, then, of arthritis with non-union bone-grafting was absolutely contraindicated. If the disability was severe enough the scaphoid should, in his opinion, be removed. He admitted that reported results had not been good, but thought this was possibly due to traumatic methods of scooping out the scaphoid. He preferred a gentle, if tedious, dissection with scalpel and forceps. He admitted that the power of the hand was less than normal, but the hand could be more freely used than in the presence of radio-scaphoid arthritis. After this operation the joint should be kept at rest for six weeks, when active movement should be gradually resumed.

In the discussion there was general agreement with Prof. McMurray's main thesis, but with regard to the secondary radio-scaphoid osteo-arthritis there were advocates of arthrodesis as well as the excision of the proximal row of carpal bones.

The Crippled Hand

Mr. GORDON IRWIN'S talk on "late surgery for disability of the hand following gunshot wounds or septic infection" was accompanied by a cinematograph demonstration. For old "flares" he favoured delayed incision and active movements throughout. Provocative massage was advisable before doing a plastic operation, on account of the danger of "flares." For Dupuytren's contracture, excision and grafting was better than tenotomy. For stiff fingers, the position of the bones when fractured was immaterial. The motor apparatus was, however, most important. He had never succeeded in restoring movement in stiff fingers by any form of surgery. It was justifiable to amputate a finger if it interfered with the patient's working capacity, but amputation of the hand was done too often. He had performed several successful cineplastic amputations, but the limb-fitters had never been able to fit a suitable prosthesis. Repair of extensor tendons was usually successful; repair of flexor tendons gave poor results. In amputation of the finger the head of the metacarpal should be left, because function was more important than a cosmetic result. He had not seen painful stumps after finger amputation except when there was a question of compensation or pension. Excision of nerve bulbs never succeeded in abolishing the tenderness. Correction of malunited phalanges by ostectomy gave bad results. Fingers should not be splinted for longer than 7 to 10 days. In splinting, the thumb should not be held in the plane of the hand, but be abducted and at a right angle to the plane of the hand. He was not in favour of doing plastic reconstruction of fingers.

Mr. KILNER emphasized that for crippled hands prevention was better than cure. After seeing burns treated in many hospitals he was a strong supporter of the Bunyan method, and, in particular, he advocated the first-aid Bunyan bag filled with a sulphonamide. The important things in the treatment of burns were the early control of infection and the early removal of necrotic tissue, so that the raw area could be covered with a skin graft at the earliest moment. The best dressing for a raw surface area was transplanted skin. Early movement of the fingers was most important—another argument in favour of the Bunyan bag. The nursing difficulties were greatly lessened when this bag was used, because the patient could be moved painlessly. In treating burnt hands the forearm should be slung. Resting the hand on a pillow encouraged deformity. In Dupuytren's contracture, and in burns, the important question was, Has skin been lost? If so, it should be replaced by a graft. He inquired whether any operation on fixed finger-joints was worth while, and he thought that the value of cineplastic amputations should be reinvestigated. Mr. STEVENSON thought that scarcity of material would prevent the wide application of the Bunyan-bag treatment; a short arm bag would be economical; a further economy was the manufacture of electrolytic sodium hypochlorite in hospital. He was not satisfied that the ideal first-aid treatment for a burn had yet been found, and thought we might go back to an oily solution. He had had good results by grafting skin on the end of a denuded terminal phalanx, but not much success in repairing flexor tendons in the hand. He was strongly opposed to the treatment of hand and finger injuries in a septic casualty department. All patients with these injuries should be admitted; they ranked in urgency with fractured femurs. Rear-Admiral GORDON-TAYLOR said that many burns had been treated by tanning, but it was not generally realized how many patients had at times to be looked after by one doctor, who, perforce, chose the quickest and simplest treatment. He deprecated the modern view that cut tendons should not be immediately sutured.

Mr. IRWIN, in reply, said he had himself had the two flexor tendons of the index finger sutured two weeks after they had been cut. The result was excellent. He always used to advocate immediate suture of cut tendons, but after reviewing his cases he decided to suture later, and his results since had greatly improved. He advocated the Bunyan bag as a first-aid treatment. Lengthening fingers with bone grafts covered with grafted skin was rarely worth attempting because a finger was very little use unless it possessed delicate sensitivity. In repairing tendons he had successfully grafted extensor tendons, but had failed with flexor tendons.

Dr. E. S. MARSHALL opened a general discussion on "rehabilitation in Ministry of Pensions hospitals."

The Nov.-Dec. number of *Industrial Welfare and Personnel Management* (the journal of the Industrial Welfare Society, 14, Hobart Place, S.W.1) includes a timely article by Dr. H. M. Vernon on the relation of long hours of work to reduced output, which emphasizes the need to distinguish between the short-sighted policy which aims at an increased output for a few weeks only and the long-sighted policy which aims at a steady output enduring for months and even years. He stresses the point often made in these columns that the hours usually adopted in this country are almost certainly too long for an extended and prolonged effort. There is also a paper on industrial dermatitis by Dr. A. D. K. Peters, being part of an article published in the current number of the *Practitioner*; and an abstract of a lecture by Prof. J. C. Drummond on the nutritive value of canteen meals.

WORK OF THE MEDICAL CORPS IN THE U.S.S.R.

BY A SOVIET DOCTOR

Until the end of the 19th century military medicine was influenced mainly by one idea—to treat the wounded soldier because the latter was a sick man and as such had the right to claim medical help. Armies at that time were not large and they suffered fewer casualties because destructive arms were not nearly so developed. New drafts to replace the losses were obtained relatively easily: the proportion of the mobilized among the people was not large. Modern wars, on the other hand, are distinguished by particularly intensive fire; destructive arms have been greatly developed in both quality and quantity; losses have become very high. This means that medicine is now faced with a new problem—the rehabilitation of the greatest possible number of casualties in the shortest time. Were the belligerent Powers to allow themselves the luxury of neglecting medicine, then no war potential could be large enough to replace human losses. Thus the medical service has become not only an organization for the administration of treatment to casualties but an integral part of the military apparatus for Army reinforcements.

Two Ways of Thinking

And even that is not all. The solution of the problem also depends on the approach made to the part which the soldier has to play in the Army, and this, in its turn, is conditioned by the political system. For the Germans, for instance, the soldier is nothing. Man as a human being does not exist for them. The philosophical conception of Nazism, as defined by themselves, consists in the supremacy of race and in the idea of State power dominating the world. There is no place in this conception for the protection of an individual. Hence, also, the "philosophy" of the German military medical service. A wounded man who requires prolonged care and treatment is so much ballast for them, a burden to be dropped and finished off.

The medical doctrine of the U.S.S.R. has as its focus the life of the Soviet man, the Soviet patriot. The strength of our Army is not measured by the number of pawns but by the number of highly intelligent Red Army men; and the conclusion to be drawn from this doctrine is a fight for the life of every Red Army man, every Soviet citizen.

Prophylaxis and Hygiene

The military medical authorities paid the greatest attention to prophylactic measures before the war. Soviet military medical officers are not only surgeons, physicians, narrow specialists, but, in the first place, hygienists—they watch over the hygiene of food, accommodation, clothes, and the personal health of Red Army men. Realizing the importance of sport in the training of troops, it has been placed under the strict control of medical officers; and the whole sports organization in the Army is supervised by the medical authorities. The widespread adoption of prophylactic measures helps to prevent food-poisoning, seasonal respiratory illnesses, and infectious disease.

Field Clinical Medicine

The second principle of our military medicine lies in the wide use made of clinical medicine in the Army. Soviet clinical medicine has long since ceased to regard casualties as surgical cases. The wounded man is, before anything else, sick, and needs as much general as surgical treatment. The wide philosophical interpretation of pathology and therapeutics as "anthropathology" and "anthrotherapeutics," as opposed to local pathology—the treatment of the patient and not of his disease or organ—allow one also to make a different approach to the problem of the wounded man. In addition, the intensity of contemporary battles and the immensely difficult conditions in which modern soldiers are placed cause considerable increase in somatic and neuropsychological illnesses. Clinicians observed this already during the 1914-18 war; a large number of cases of nephritis, hepatitis, and diseases of the respiratory tract caused at times more casualties than gunshot wounds. Soviet medicine therefore started on the road of large-scale clinical medicine in the Army, and introduced into military medicine the new chapter of "field clinical medicine." This means in effect that military medicine must solve the problem of rapid diagnosis and treatment in the operational field environment. Diagnostic laboratories, field *x*-ray installations, electrodiagnostic and therapeutical apparatus, are all in universal Army use, up to the front-line hospitals. We know that even in times of peace early diagnosis and rapid medical intervention cut short pathological processes or reduce the periods of hospitalization to a minimum. In times of war this is a decisive factor.

Surgery at the Front

As regards surgical treatment, Soviet military medicine is guided by the principle of maximum surgical aid during the first hours. This forced us to employ all means for the speedy removal and evacuation of casualties from the immediate fire zone. In this work medical orderlies, men and women (volunteers), display miracles of courage. The People's Commissar for Defence, Comrade Stalin, compares the work done by the medical personnel to that of the best tank drivers and airmen. The numbers of men and women decorated for the evacuation of wounded from the battlefield are counted by the thousand. The second measure is the administration of the best surgical treatment to the wounded in the field. Surgical hospitals, equipped with most modern apparatus and staffed by the best surgeons, work under direct enemy fire. If one remembers that these hospitals and medical posts are all stocked with transfusion blood brought by the Air Force, and that they have at their disposal all modern chemical and pharmaceutical supplies, then it is understandable why the percentage of recovery and return of soldiers to their units reaches the high figure of 70.

Non-medical Personnel

In conclusion, a few words must be said about the medical personnel. In the Red Army, medical personnel (excepting doctors) are people who go to the front as volunteers to do this work. Hundreds of thousands of young people (mainly girls) were already trained in peacetime for this work in all factories, institutions, and collective farms. The Red Cross and Red Serpent organizations were able to prepare fully the necessary cadres of the middle and lower medical personnel. They all passed courses in bandaging, blood transfusion, and first aid, and they are all blood donors. Direct blood transfusion on the spot at field hospitals and dressing stations has become an everyday feature at the front. It is also an expression of the unbreakable link which exists between our Army and people.

In summing up it may be said that the Red Army medical doctrine is based on the importance of the human element—the high value of the Red Army man. Its corner-stones lie, therefore, in the prevention of disease and in field clinical medicine. Early surgical intervention and treatment account for the high percentage of cure among the wounded. This implies, in practice, the concentration of all the best medical personnel and equipment at the front. Great capacity for self-sacrifice on the part of the personnel ensures the best possible care for the wounded and sick.

Workers with the Friends' Ambulance Unit, that body of some 700 persons who, unable to reconcile warfare with their religious beliefs, devote their energy and resources to the relief of the suffering which follows in the wake of war, share much of the hazards and dangers with the combatants. In the Middle East the unit has more than 150 members, some 40 of whom, in Egypt and the Western Desert of Libya, have been working under the auspices of the British Red Cross, especially on mobile surgical units. Some of them manned a hospital in Tobruk until that place fell. The report of the third year's work describes the establishment of mobile clinics in Syria, to which come Moslem, and Christian, and Druse; the distribution of medical supplies along the Burma Road; the salvage of £120,000 worth of such supplies from the docks at Rangoon when the Japanese were closing in, and their transport for 3,000 miles into the northerly provinces of Free China; the provision of surgical aid in the raided towns of Burma; the sending of a surgical team for the help of Chinese on the Yunnan front; the organization of first-aid posts in view of the possibility of air raids on Indian cities; and in Ethiopia the sending of 40 men, including 2 doctors, for pioneer medical work in the outlying regions where there are at present few or no facilities for combating the high incidence of sickness. Apart from all this work over-seas, 186 members of the unit are at E.M.S. and other hospitals in this country, and 90 have been seconded to the Friends' War Relief Service in the various raided areas of England. The council of the unit, which includes 9 medical members, one of whom is Sir George Newman, is appealing for at least £30,000 in order that the unit may maintain through a fourth year of war its purpose of serving where the need is greatest.

Reports of Societies

THE PIONEER HEALTH CENTRE

At a meeting of the Maternity and Child Welfare Group of the Society of Medical Officers of Health on Oct. 24, with the president, Dr. CATHERINE MORRIS JONES, in the chair, Dr. INNES PEARSE, co-director of the Peckham Pioneer Health Centre, gave an address on the principles which had governed this very successful experiment since its foundation by Dr. Scott Williamson and herself.

The Peckham Centre was conducted as a club, the athletic and social activities offered for all ages serving as an incentive to families to join and also concealing a careful technique whereby physical and mental health was fostered by means of swimming-bath, gymnasium, playgrounds, music rooms, and workshops. The Centre was self-supporting, though each family paid only a shilling a week. The families belonged to the elastic middle class, including artisans and professional men: yet even in this picked class Dr. Pearse reported that 90% of the individuals showed deviations from health which could be detected by clinical examination alone. Health was regarded at the Peckham Centre as a positive condition and not merely the absence of sickness, and the medical directors aimed at the cultivation of mental and physical health in the family as a whole. With careful periodic medical overhauls of each individual and routine laboratory investigations, a feature was made of family conferences and discussions between the parents and the medical man and woman who supervised the health of the family. Dr. Pearse described how fathers and mothers could be brought by this means to realize the biological significance of family life. The health sense of the little community was excellent; diphtheria immunization presented no problem because one family followed the example of another in each health measure undertaken. The Centre achieved its success by the active good will of its members, and the two medical directors had cause to congratulate themselves on a noteworthy achievement. They brought about, at a stroke, the health examination of all members of the family and all ages; they involved the father in the active exercise of parenthood; and they devised a medium whereby leisure could be utilized as a means for the development of physical and mental health. The lessons from Peckham should not be ignored in planning the future of medicine.

MASS MINIATURE RADIOTHERAPY

At a meeting of the Association of Industrial Medical Officers Wing-Commander R. R. TRAIL and Dr. F. R. G. HEAF spoke on the future of mass radiography in industry.

Wing-Commander Trail said that mass miniature radiography must be conducted on a carefully planned method if economy of time and materials was to be ensured. Both adequate space and suitable staff were necessary to use static apparatus economically, and about 100,000 cases a unit a year could be dealt with. This would mean one-way traffic through waiting and dressing rooms, and the provision of a suitable dark room, drying room, viewing room, and administrative office. The staff needed were the medical officer, radiographer, the positioner, marshal, and clerk. The medical officer should be a competent chest physician and, in common with the rest of the team, have special training in mass miniature radiography. A good team could easily manage up to 100 patients an hour. Miniature radiographs were often difficult to read, and in all doubtful cases a full-sized film should be taken; this was necessary in about 3% of the cases seen. Symptomless heart abnormalities, new growths, cysts, etc., might also be discovered at the same time. As regards the extent to which this new method would crowd out the beds available for pulmonary tuberculosis, there might be some difficulty at first, but any extra expense involved would be more than saved within ten years.

Dr. Heaf said that the use of mass miniature radiography on a large scale was a pleasing dream for the idealist but a nightmare for the realist. There were many difficulties. There would be opposition from the public, who would have to be carefully educated to appreciate the value of early diagnosis. Financial help during treatment and a guarantee that employers would co-operate in finding alternative employment for those that required it would be necessary before the confidence of the public could be gained. Planned liaison between tuberculosis officer, industrial medical officer, and panel doctor would be imperative. The public tested would fall into three groups: (1) Normal cases; these patients must realize that a normal film did not necessarily imply future immunity. (2) Mild or very early cases for whom modification of work or curtailment of working hours would be necessary. (3) Cases which could only be treated in a sanatorium; the scheme for financial help to compensate these patients for loss of income, etc., was one which would be widely welcomed.

There must be some method, Dr. Heaf said, whereby a suspect could appeal against the findings of the radiographic examination. A subsequent examination and further investigation might prove the original diagnosis to be at fault. It had been suggested that before a doubtful case was notified inclusion on a temporary register of suspects might be desirable. This would, in many cases, avoid the stigma attached to formal notification. Cases on the suspect list could be seen at frequent intervals, and progress or otherwise could determine whether discharge or notification was necessary. The ancillary health services must move forward with miniature radiography, improved methods for the relief of bad environment being just as important as improvement in methods of treatment. The effects of miniature radiography on established procedures of life insurance and superannuation schemes might be debated with interest.

RUPTURE OF THE UTERUS

At the last meeting of the Section of Obstetrics of the Royal Academy of Medicine in Ireland the president, Dr. NINIAN FALKINER, gave an account of 12 cases of rupture of the uterus which had occurred in the Rotunda Hospital during the past two years. Of the 12 mothers, 3 died and 9 recovered; of the 12 infants, 3 recovered and 9 were lost. Two of the surviving children were in cases in which the rupture was incomplete, and the third in a case in which the rupture was produced during extraction of a breech. The first maternal fatality was undiagnosed and treated as post-partum haemorrhage, the second was undiagnosed and treated as ante-partum haemorrhage, and the third was a most unusual case which followed a fall in the street. Of the mothers who recovered 4 were treated by subtotal hysterectomy and 4 by suture of the uterus. One was treated conservatively. Of the mothers who died 2 were not treated and one was treated by subtotal hysterectomy after Caesarean section. The average age was 35, and the average parity 5; none of the patients was a primigravida. In 9 cases the patient was in labour; in 3, not. The rupture was spontaneous in 9 and traumatic in 3 cases (fall, injudicious use of forceps, and difficulty with extended arm). The rupture was complete in 8 cases and incomplete in 4; it occurred in 3 cases in which classical section had been performed. The diagnosis was made in 9 cases before treatment was instituted, and in 7 of these it was made by correlating the symptoms and physical signs and in 2 by directly palpating the rupture.

Dr. R. M. CORBET said he had seen 35 cases of rupture of the uterus, 16 of which had occurred during the time he was Master of the Coombe Hospital. The mortality of the total collected series was 28.6%. About 1930 he had come to the conclusion that, if rupture were diagnosed or strongly suspected before delivery of the foetus, laparotomy should be performed, the uterus being removed or retained according to the conditions found. Since then he had had 16 cases of rupture of the uterus under his care. The treatment was primary Caesarean hysterectomy in 11 cases, with one death from mesenteric thrombosis. Laparotomy and suture of the rent had been done in 2 cases, with no death, and one patient died just as he arrived on the scene before any treatment could be undertaken. From these 16 cases 8 live babies were obtained. He felt that the advice, given in so many textbooks, to deliver the patient vaginally after rupture had been diagnosed was exceedingly dangerous.

Prof. A. H. DAVIDSON observed that the fact that 3 of these ruptures had occurred in "classical" scars should, he thought,

teach obstetricians not to do "classical" sections. All ordinary sections done either before or during labour should be done in the lower segment. He was convinced that all cases in which the rupture was in the body of the uterus should be treated by laparotomy, followed by whatever treatment the doctor in charge of the case thought best. He thought that there was still a place left for conservative treatment by plugging the rent. The "classical" scar in a case in which the section had been done for toxaemia was a very bad one.

Dr. O'DONEL BROWNE, Dr. J. G. GALLAGHER, Dr. JAMES APTHORP, Dr. T. M. HEALY, and Dr. EDWARD SOLOMONS also took part in the discussion. Dr. FALKINER, in reply, said that a desperate condition in failed forceps was when the uterus had been even partially ruptured. These cases were often in primigravida, and when the abdomen was opened hysterectomy was the only course to adopt. It was very difficult to decide whether plugging the rent was going to be effective or not. Sometimes the control of haemorrhage could be effected only by total hysterectomy. The case of transverse presentation had been treated by external version. In these cases the first thing to be thought of was the patient's life; the second was the necessity for preserving the function of reproduction.

At the annual general meeting of the Association of Anaesthetists of Great Britain and Ireland, held at 1, Wimpole Street, London, on Oct. 28, the following officers were elected for the ensuing year: President, Lieut.-Col. Ashley Daly, R.A.M.C.; vice-president, Dr. C. F. Hadfield; hon. treasurer, Dr. Z. Mennell; hon. secretary, Dr. A. D. Marston.

Correspondence

Pathology of Crushing Injury

SIR,—The circumstances of war have recently been such that cases of crushing injury are now very rarely encountered in this country. The review by Dr. E. G. L. Bywaters (Nov. 28, p. 643) is, nevertheless, extremely valuable, and serves to remind us that the pathology of the condition is still obscure in spite of the continued efforts of large groups of research workers.

Shortly after Dr. Bywaters's first paper appeared in the spring of 1941 I was permitted to study the pathology of 3 cases in considerable detail (*J. Path. Bact.*, 1941, **53,** 403). I was not impressed by necrosis or regeneration of the tubular epithelium as a sufficient cause for suppression of urine, and emphasized blockage of tubules by casts. Such epithelial necrosis and regeneration as occurred was attributed to these casts, and tubular basement membranes were well preserved. The kidney lesions were compared with those found in multiple myeloma. The impaction of small casts in the lumen of almost all the tubules in the crush syndrome must result in a rise in intrarenal pressure, and no one tubule can then dilate to pass glomerular filtrate as neighbouring tubules are all similarly involved. In contrast the slow and probably intermittent deposition of casts in myelomatosis does not involve every tubule at once, neighbouring tubules allow the affected tubule to dilate slightly, fluid continues to pass, and the casts grow by accretion until surviving tubules are dilated by large casts.

In the crush syndrome casts occupying only a short segment of tubule may appear relatively unimportant and be found only in a few tubules in any one section, yet almost every nephron may be blocked. Other workers have found it necessary to emphasize extensive necrotic and regenerative changes in the epithelium of the renal tubules and to discuss their production by various products of damaged muscle. Such lesions may result from a variety of superimposed factors, including insufficiency of the blood circulation. The problem is to decide what is the basic and essential lesion. The observation of Dr. Bywaters that crushing of the muscles alone in the rabbit will produce all the signs and symptoms of crushing injury except the renal failure is of special interest, and we have made similar observations in the mouse where we now suspect the same explanation—i.e., a low myohaemoglobin content of the muscles. The production by Dr. Bywaters of renal symptoms by the injection of pure myohaemoglobin into a rabbit acidified with ammonium chloride is very relevant. His observations on whether this substance acts by its precipitation as casts in the acid urine or by damage to the renal epithelium will be of the greatest significance.

Animal experiments are, however, often difficult to interpret. For example, Eggleton *et al.* (*Journal*, 1942, **2,** 392) report somewhat inconstant collections of material within the lumina of the terminal part of the proximal convoluted tubules while the distal and collecting tubules are usually free and distended after the compression and traumatization of the limbs of anaesthetized dogs. This is certainly not the pathology found in human cases. Functionally, the kidney of the dog may differ from that of man, but until this is proven the morbid anatomist must insist on a closer correspondence of structural lesions before accepting the identity of these conditions.—I am, etc.,

Queen's University, Belfast. J. EDGAR MORISON.

Small-pox: Its Diagnosis and Xylol Treatment

SIR,—As small-pox has once again made its appearance in the British Isles in epidemic form, may I, with 33 years' clinical experience in India, be permitted to draw attention to the pamphlet by the late W. McConnel Wanklyn, *The Accurate Diagnosis of Small-pox*, price 6d., printed by Ash and Co., Ltd., Henry Street, Tooley Street, London, S.E.1. This pamphlet should be in the possession of every doctor. After reading and learning its 24 pages it is almost impossible to have any doubt as to the diagnosis of chicken-pox or small-pox or to make any mistake, at any stage, in either disease.

No textbook that I know of or have read gives any specific and definite line of internal treatment for small-pox; yet there is one—xylol. I have used it for years; in my experience this is the only general treatment of any value, and it often acts like a charm. Even in confluent small-pox the results obtained are unique; no other treatment that I am aware of gives a like result. The earlier the treatment is begun the better: one *must* commence early.

This is the treatment: Xylol, 30 min. four times a day in milk—i.e., 2 drachms a day—for 3 days; then cut down to thrice daily for 3 days; then twice daily for 3 days; then stop. The above is the maximum dose for an adult man of 10 stone or over, and usually 90 min. a day is sufficient; for women of 7 to 8 stone, 20 min. per dose as above; for children, 10 min. per dose; and for babies 5 min. per dose. It may be rather nauseating; if so, give smaller doses more frequently.

How xylol acts I do not know, but it appears to be excreted by and in the skin. Its internal administration causes a flattening of the eruption, prevents suppuration, and reduces scarring to a minimum; toxaemia is greatly diminished and often not present. There is no fetid odour. Recovery is rapid. The pustules often become dry, dark, hard scabs in a few days, and instead of a prostrate patient one finds him sitting up in bed. This is no fairy-tale: it is true. For success xylol *must* be started early. If begun early this is almost an abortive treatment.

Other essentials are: (1) A darkened room. (2) For face, paint spots with tr. iodi or apply iodex. I do not favour potassium permanganate. (3) For mouth, frequent applications of glycerin of borax. (4) For eyes, wash often with boric or saline solution. Apply 3 times a day acriflavine drops gr. 1/2 to ounce (equals 1 in 1,000). At bedtime, half-strength yellow oxide ointment: never omit this. (5) For scrotum, always support with suspensory bandage and apply fuller's earth or other dusting powder. (6) When rash is drying and scabs are forming, apply iodex with methyl salicylate to face and salicylic ointment *B.P.* to the body. (7) Baths: during convalescence give twice daily.

Xylol treatment is equally effective in severe chicken-pox, and good results have been obtained in cases of pemphigus.—I am, etc.,

Haddenham, Ely, Cambs. S. G. S. HAUGHTON, Colonel, I.M.S. (ret.).

*** Xylol in the treatment of small-pox is mentioned in several textbooks on fevers. It appears to have been tried first by Zuelzer in 1871, but fell into disuse. Teissier (*Nouveau Traité de Méd.*, 1922, **2,** 281) warmly recommended it in a total amount of 1 to 2 drachms for adults in the 24 hours, divided into 4 or 5 doses. It is not claimed that it possesses

any specific action, but that it arrests suppuration, dries up formed pustules, diminishes cicatrization, and acts as a deodorant. It has no action in primary haemorrhagic or the worst forms of confluent small-pox. In a single epidemic in which Belin of Paris tried the method the fatality rate fell to 12.34%, compared with 31.37% for the hospital before xylol was used. Xylol seems to act by reducing in some degree secondary infection of the pocks, provided that the infection is not overwhelming, as in malignant confluent cases. Its use may be superseded by that of the sulphonamides, under which the skin lesions of small-pox are modified, the septic fever diminished or suppressed, and septic complications and consequent mortality rates reduced (P. B. Wilkinson, *Lancet*, 1942, **2**, 67, and N. N. Chari, *Indian med. Gaz.*, 1942, **77**, 91). In the meanwhile Col. Haughton has done well to record his experience: it is not the first time that a remedy of some efficacy has been forgotten.—ED., *B.M.J.*

What Constitutes Diphtheria?

SIR,—May I claim a little space in your columns to raise a matter which I consider to be of some urgency? I want to ask what constitutes diphtheria. In our medical schools we were taught to look for a very definite clinical picture and to confirm diagnosis by demonstrating the presence of virulent diphtheria bacilli. In practice we have swabbed every sore throat which showed any sort of exudate or membrane, and have, with some justification, bundled off to hospital any case in which the "swab was positive." Among these cases there must have been a number when the illness was caused by some other organism, the patient being a "carrier" of *Bacillus diphtheriae* by virtue of natural or induced immunity. Such cases were exposed to no extra risk by being nursed in diphtheria wards, and it was all to the good that carriers should be "out of circulation" until free of *B. diphtheriae*.

But the widespread immunization of children must have resulted in the wholesale manufacture of diphtheria carriers. This (besides being a pressing reason for immunizing all the others) must also have multiplied the number of cases wrongly diagnosed as diphtheria merely because diphtheria organisms were demonstrably present. It is obviously irrational to treat with diphtheria antitoxin a patient suffering from a streptococcal infection who has repelled threatened invasion by diphtheria organisms actually in contact with his mucosa, and it is undesirable to add to the embarrassment of our overtaxed isolation hospitals.

But another danger, less obvious, is perhaps more important. If we continue to diagnose diphtheria on the evidence of the presence of *B. diphtheriae* in patients known to have been immunized (and probably, if we knew it, Schick-negative) we shall inevitably, and possibly unnecessarily, bring discredit on the efficacy of immunization. What is more, whether we like it or not, the Ministry has put on to the profession the responsibility for advocating immunization (*vide* advertisements in Press, etc.). So it is up to us to see that the public does not get wrong ideas about the value of immunization or of the profession in whose name it is proffered.—I am, etc.,

Swinton, Lancashire. G. D. WILD.

First Aid for Fractured Spine

SIR,—Mr. D. K. Mulvany (Dec. 5, p. 676) has given an answer to Dr. J. C. Matthews's question (p. 677) as to how the first-aider is to diagnose a fractured spine.

A great deal of harm continues to be done by meddlesome first aid, condemned in the St. John Ambulance book but encouraged in many competitions. The first-aider must be instructed not to "mess about." I have too often seen a patient stripped nearly naked in the open air by first-aiders in their search for bruises that do not matter. The first-aid books teach that where a fracture is suspected it should be treated as a fracture, and this applies to fracture of the spine. Severe pain in the vertebral column, with or without shock, is sufficient to justify the suspicion of a fractured spine and the treatment thereof.

The method, details of which I have sent to over 100 correspondents who responded to my former letter, has been justified by many years of practical experience of a not inconsiderable number of actual cases. The title *First Aid to the Injured* needs emphasis. It is the injured person, not his injuries, that is of first importance.—I am, etc.,

14, Hobart Place, S.W.1. THOMAS E. A. STOWELL, F.R.C.S., Chairman, Advisory Medical Committee, Industrial Welfare Society.

Tetanus

SIR,—I am glad that my old teacher, Dr. Leslie Cole, has given us his expert views on this subject in his letter (Dec. 5, p. 678). Perhaps I have had more luck than most people in getting cases with sublethal doses of toxin absorbed from their wounds, in that I always treat injuries, particularly air-raid, garden, and street casualties, with suspicion. I do not suture any penetrating wound, however small it may be, until I have flooded the wound with H_2O_2 and excised the skin edges.

I quite agree with Dr. Cole that some cases are hopeless, whatever you do for them, and I therefore feel that the small amount of added shock produced by excision of the wound at once is justified if it either results in a series of cases with sublethal toxaemia or, better still, prevents the onset of tetanus or gas gangrene.—I am, etc.,

Weybridge. JOHN H. HANNAN.

Preparation of the Hands for Operation

SIR,—As one who started a surgical career before the advent of gloves, may I add a postscript to Mr. W. A. Cochrane's article (Nov. 28, p. 635) on the possible absence of gloves and the washing of hands. When I was a dresser our method of washing was as described by Mr. Cochrane, except that we did not use spirit soap and we did not rinse in saline after the washing. All our hands got rough and some of our arms got sore. Perhaps the absence of the saline rinse accounted for this. I do not for a moment wish to cast doubts on the results he describes, but with us, on the firms where hands were used freely, there was, I am sure, a much higher incidence of sepsis than would be tolerated now. In Sir Arbuthnot Lane's wards there was little sepsis, but he used a rigid "no touch" technique. Mr. Rutherford Morison operated inside the abdomen without gloves, wearing them only while making the incision and for sewing up. He said he preferred this, and that the peritoneum had such a good resistance that even a gynaecologist could operate in the abdomen with safety (*pace* the present generation: this was 20 years ago). The moral would seem to be: "No gloves—no touch," except perhaps in the abdomen.

Some bacteriological investigations were done at Guy's on the washing of hands, and they showed that washing in running water reduced the bacteria minute by minute for about 7 minutes, then the count rose again slightly. From smooth hands most, but by no means all, the bacteria could be removed; but once the hands were rough the same degree of cleanliness was quite impossible to achieve. The subsequent lysol or cresol soak made no further reduction. The use of lysol, therefore, was useless, and if, as I think it must have been, it was a roughening factor, it was actually harmful.

As Mr. Cochrane points out, thoroughness, as in everything else, is essential, and basins are probably better to wash in than running water, as soap solution is in itself an efficient antiseptic.—I am, etc.,

Guildford. E. W. SHEAF.

Stilboestrol for Cancer

SIR,—On the subject of your annotation on "Diethylstilboestrol for Prostatic Cancer" (Nov. 28, p. 641) I would refer readers to Dr. J. Thomson Shirlaw's letter in the *Journal* of July 27, 1940 (p. 133), in which he quotes Sir Gowland Hopkins as follows: "At one level at least of their organization, living tissues are essentially physical and chemical systems, and it is at this level we must expect to find a basis for the differences displayed by cancer cells and normal cells. Cancer-producing substances (oils, tars), though they differ from them in detail, are yet akin to substances natural to the body—for instance, to the hormones which control certain functions of sex. Subjection to prolonged administration of a sex hormone encourages the growth of glandular cancer."

I will summarize what Dr. Thomson Shirlaw says: we know that the anterior pituitary secretes two hormones—one concerned with growth, the other related to sexual development. They are antagonistic to each other. Stilboestrol has an inhibitory effect on the secretion of the anterior pituitary.

Crystals of stilboestrol implanted into adult rats were found to inhibit body growth and secretion of gonadotrophic hormone. Stilboestrol, 1 mg. twice a day, was given to a man with inoperable cancer of splenic flexure of colon; a week later the tumour could not be palpated.—I am, etc.,

Cambridge. J. A. VAUGHAN.

An Intractable Cough

SIR,—A patient attended at this clinic with a note from her panel doctor which stated that she suffered from an intractable cough, which was worse at night. The patient gave a history of a cough every winter for many years beginning in November. This winter, 1942, the cough had been worse and much more so for the last two months. She had tried everything she knew of—mixtures, inhalants, and cod-liver oil. The doctor's medicine had eased the cough a little. She was getting "fed up" and desperate. She tried her best to cure the cough. For four nights she had been awake all night. She tried to control the cough by holding her breath. There was no evidence—*x*-ray or clinical—of organic disease of the lungs. On further questioning the patient admitted that the cough frightened her. She was afraid it meant serious disease. She awoke with a dry mouth every morning.

I formed the opinion that the cough was not due to organic disease but to the patient's making a mistake in the way she tried to stop it. The condition was aggravated by the mixed feelings stirred in herself and her husband. The dry mouth in the morning indicated that she was breathing through her mouth, and actual observation showed that she breathed through her mouth habitually before each act of coughing. The cough stirred feelings which aggravated the situation and both frightened and annoyed the patient, irritated the husband, and became a source of argument between them.

I told the patient that no organic disease was discovered in her lungs, and the following advice was given: to take any medicine ordered by the doctor; to breathe through the nose during sleep and before each act of coughing; whenever she felt the desire to cough she should close the mouth and breathe slowly through the nose counting six; she should not think of stopping the cough, or try to stop it by holding her breath; she should let herself cough freely without fear, annoyance, or anger. The patient returned to me the following week and stated that she had used the method advised. She had breathed through the nose before each cough and then found that she did not want to cough. Her mind had also been relieved when informed that no disease was present.

This technique or trick of breathing control was found to be effective on one occasion when a patient was having an artificial pneumothorax refill. He said he wanted to cough. I instructed him to close his mouth, breath slowly through the nose counting six, then open the mouth and let himself cough. The patient obeyed the instructions: closed his mouth, breathed through the nose counting six, then opened his mouth, but did not cough. The habitual use of this method will relieve many dry irritating coughs without either sedatives or expectorants. In other cases reduction in cigarette smoking and in the use of condiments may also be necessary. In all cases the patient is advised to place one hand over the mouth before coughing. This method is of great value in cold, foggy weather.—I am, etc.,

P. A. GALPIN,
Chest Clinic, Plaistow, E.13. Tuberculosis Officer.

Erythroblastosis Foetalis

SIR,—Prof. Leonard Parsons's plea (Dec. 5, p. 675) for adopting another term for the condition usually described as "erythroblastosis foetalis" should be welcomed for the additional reason that this disease is by no means invariably associated with the presence of an abnormal number of nucleated red blood corpuscles in the peripheral blood. Of the four cases which I saw during the last nine months (with the diagnosis confirmed by the finding of the Rh factor in the infantile and of Rh antibodies in the maternal blood), one, while being intensely jaundiced, had only 0.5 to 1 normoblast per 100 white corpuscles, a number well within normal limits. The term "haemolytic anaemia of the newborn," as proposed by Prof. Parsons, though certainly "better and more accurate," has the disadvantage that it would not cover those cases in which production of red blood corpuscles and haemoglobin keeps pace with the haemolytic process to a degree that anaemia never becomes apparent. Of icterus gravis, erythroblastosis, anaemia, and oedema not one is an obligatory feature of the condition. I should therefore like to propose to call it "haemolytic disease of the newborn"; cases of stillbirth with hydrops foetalis and/or liver derangement may then be classified as "haemolytic disease of the foetus."

While speaking of the "ghastly sequelae . . . which so frequently occur in this disease," Prof. Parsons mentions bone changes. To the best of my knowledge severe bone lesions have so far not been described as sequelae of this condition, but zones of increased and decreased density in long bones were recently described in five cases (three stillborn and two dying within 48 hours after birth) by Follis, jun., *et al.* (1942), These authors quote two other cases (2 and 6), which showed similar lesions, reported by Caffey (1939) in a paper on "Syphilis of the Skeleton in Early Infancy: the Non-specificity of Many of the Roentgenographic Changes."

I should like, however, to present some evidence for the suggestion that a truly ghastly bone disease of so far unknown aetiology is in fact a late sequel to haemolytic disease of the newborn. I am speaking of the conditions described as polyostotic fibrous dysplasia and as Albright's syndrome, of which the latter shows in addition to a polyostotic fibrous dysplasia certain endocrine disturbances and patches of cutaneous hyperpigmentation. In an excellent paper on this latter condition Falconer and Cope (1942), in tabulating the findings in the 25 cases published in the literature prior to their own two cases, noted that four of them were said to have had icterus gravis neonatorum. They state: "Icterus gravis neonatorum has been recorded in only a few cases, although its frequency seems to indicate more than a chance association." Now, as haemolytic disease of the newborn does not always produce icterus gravis, the proportion of cases with such a history may well be higher than 4 in 27; and the fact that this bone disease is self-limited and first noticed in childhood seems also relevant in this connexion. My hypothesis that such severe fibrous dysplasia as is found in Albright's disease may be due to the effect of maternal iso-agglutinins (anti-Rh, anti-A, or anti-B agglutinin) seems further supported by the work of Nettleship (1942), who produced very similar bone lesions in rabbits by injecting them with guinea-pig anti-bone-marrow serum.

Proof or disproof of this hypothesis will fortunately be easy—namely, by examining whether any relevant serological differences can be found between the patient and the mother. I think it would also be worth while to examine radiologically cases known to have had haemolytic disease of the newborn, as one may thereby find symptomless bone changes transitional between the lesions in Follis's cases and in fibrous dysplasia.—I am, etc.,

HERBERT LEVY.

REFERENCES

Caffey, J. (1939). *Amer. J. Roentgenol.*, **42**, 637.
Falconer, M. A., and Cope, C. L. (1942). *Quart. J. Med.*, n.s., **11**, 121.
Follis, R. H., jun., Jackson, D., and Carnes, W. H. (1942). *J. Pediat.*, **21**, 80.
Nettleship, A. (1942). *Amer. J. Pathol.*, **18**, 689.

Volvulus of Ileum in a Newborn Infant

SIR,—I should like to put on record a case of volvulus of the ileum in a newborn baby girl. I have looked through the available literature on the subject and cannot find a case recorded.

The infant had a normal birth, and passed meconium once quite soon afterwards, but not again. She began to vomit, first only after feeding and then more frequently. I first saw her when she was two days old, and found her to be crying with pain, refusing to take the bottle, and vomiting even water. The abdomen was a little distended, the umbilical cord appeared healthy, and the little finger could be passed well up into the rectum without encountering any stenosis. With great difficulty the infant was persuaded to take a small barium feed, and screening showed the feed to pass into the stomach, which was pushed up well under the diaphragm. Subsequent radiographs showed the feed to have reached the jejunum, but 24 hours later the meal had advanced no further.

A diagnosis of intestinal obstruction probably due to congenital atresia of the small bowel was made, and operation decided upon the third day after birth. By now the baby was losing ground rapidly, and after a subcutaneous saline required no more than a small dose of cyclonal sodium, 0.005 g., into the anterior fontanelle to provide anaesthesia for laparotomy. To our surprise we found the whole of the ileum completely gangrenous, the peri-

toneal cavity containing the most offensive fluid. Volvulus of the whole ileum had occurred, twisted at least five times, the axis being the mesentery in the right iliac fossa. The jejunum was distended with barium up to the strangulated ileum. Owing to the distension of the bowel and the state of decomposition it was impossible to determine what developmental abnormality had given rise to this condition. The baby died soon afterwards.

We concluded that the twisting of the ileum had probably started during birth, and that subsequent distension had only served to twist the bowel again and again. It seemed amazing that a baby of this age could be alive at all with an abdomen distended by gangrenous gut and putrid fluid. We also felt that had we been quick enough to recognize the condition on the first day and had decided upon immediate operation we might have saved the child's life.—I am, etc.,

Chelmsford. M. D. SHEPPARD.

Phosphorus Poisoning from Bullet

SIR,—In his article (Dec. 5, p. 664) Mr. A. J. Blaxland remarks that a further antidote for use in such cases would be important. May I suggest that a weak solution of potassium permanganate to oxidize the phosphorus would very likely answer the purpose. The solution would have to be weak as the reaction is violent, and would probably be best given by the continuous drip method.—I am, etc.,

Stoke Poges. W. L. PEACOCK.

Medical Planning

SIR,—The Medical Planning Commission has presented us with a very comprehensive survey of the present position of medical work, but I cannot help feeling that it has not so clearly defined the foundations on which to build a sound practice of medicine. Medicine to-day is a large subject, and therefore it is necessary for its practice to be classified into workable departments.

In approaching this subject I think it is desirable to assess what is good in the present system. For my part I cannot imagine the British public yielding its freedom in such a personal matter as health to full bureaucratic control; neither can I see the British public shopping for health at chain medical stores, such as are envisaged. In short, any scheme which does not adopt the family doctor as its basis must fail, and any scheme attempting to dispense medical service without an individual doctor accepting direction for a particular patient must lead to chaos.

Still all is far from well in the world of medicine, since facilities are not available for all doctors to practise their profession up to the extent of medical knowledge. Too much is made of "opinions" when it is "facts" that are wanted. Facilities for acquiring "facts," such as are forthcoming from x-ray investigations, biochemical tests, etc., are a prime necessity in any scheme. Medicine could perhaps be put on a workable basis by classification into two departments: (1) practical medicine; (2) social medicine.

1. Practical medicine might be defined as that part of our science which pertains mainly to the individual, and all aspects concerning the health of the individual should be carried out by, or planned in association with, the general practitioner. Here preventive measures should hold a prominent place. It seems to me desirable to do away with the term "preventive medicine"; its association with public health has led to a false differentiation in the mind of the physician, and particularly is this true of the minds of our teachers of medicine. If prophylactic measures were an integral part of practical medicine their application would become automatic.

To carry out such a conception of practice I would suggest nationalization and co-ordination of all hospitals with mainly whole-time staff. A department of the principal hospital should be available as a diagnostic and specialized treatment centre for the use of practitioners in the area served by the hospital. A health centre, including ten doctors, could not be equipped economically to meet all requirements of diagnosis, etc., and therefore, though an improvement on the present situation, would not be a solution of our difficulties.

The general practitioner might be left as at present to start with, but having the hospital facilities outlined above. He would be working an improved panel system which might be more economically conducted by a State Department. Since 90% of our population will soon come under State medical control it is idle to discuss State Medical Service; our concern is rather with the best method of carrying out medical practice.

2. Social medicine, on the other hand, covers the whole realm of collective medicine and cannot possibly be incorporated in any scheme of practical medicine. Those responsible for social medicine are in a different category: their associations and endowments of authority could not be vested in every medical practitioner and made workable. As a possible plan I would suggest that social medicine be a whole-time State service. It involves most departments of civil administration, and can only be properly co-ordinated as a State Department. Its object would be positive health in the political sense—the welfare of the State—and include housing, conditions of work in the factory, epidemic control, statistics, etc. In this connexion I feel that school medical inspection and services for tuberculosis, venereal diseases, fevers, and possibly maternity services, are more perfectly administered and conducted under social medicine than under a diffuse system in medical health centres. These services have a collective social character requiring specialization if they are to be effectively carried out.

All specialized and diagnostic facilities should be open to all members of the community. After a period of 5 or 10 years general practice could be reviewed and then more aptly co-ordinated in a comprehensive scheme. Consultant work and research could be adapted within the scheme suggested. I should perhaps elucidate the standpoint taken on the term "preventive medicine." To me this term suggests insurmountable inimical forces against which the public must be protected—surely a negative attitude. "Positive health," on the other hand, must mean not only the health of the individual but also his environment. It stands for a positive basic approach to health, and involves in its achievement dealing with those inimical factors whether they be of the individual or the social order. This is more than tilting at nomenclature; it is a question of concept.

This very general outline offers the basis of a scheme wherein every practitioner would acquire "the tools" for his particular "job."—I am, etc.,

Southport. S. H. STEWART.

Reporting of Deaths to Coroner

SIR,—I was interested to read the letter on this subject from Dr. W. B. Purchase (Dec. 5, p. 677). The possibility of some confusion of thought, to which Dr. Purchase rightly draws attention, is increased by the fact that neither the full text of counsel's opinion nor the letter upon which he was asked to advise has been published. I have hesitated previously to enter your correspondence columns in relation to this subject, both because I am the coroner whose letter to the hospitals was the subject of counsel's opinion and, not less, because the opinion of counsel appeared to me fully to support the legal position set out in that letter. There is, however, an important misconception which has crept into the matter, and which is not entirely removed by Dr. Purchase's letter.

My letter was, as Dr. Purchase points out, a request that certain deaths should be reported to me. To this request was added a statement that in certain classes of deaths (including those within 24 hours of an anaesthetic or operation) there was a duty at common law to report to the coroner. The opinion of counsel entirely supports this view of the common-law duty of medical practitioners. My letter then went on to say that it was desirable that certain other deaths should be reported, including those within 24 hours of admission to hospital. I did not, and of course could not, suggest that there was any legal duty on the part of medical practitioners to report this latter class of case to the coroner.

I am anxious to clear up any misunderstanding that may exist about the two classes of cases, more particularly as the necessarily compressed article in the *Supplement* of Sept. 12 does, I think inadvertently, convey the impression that I had drawn no distinction between them. The unabridged copy of counsel's opinion, which I have had the advantage of seeing, does draw the necessary distinction.

I am of course in entire agreement with Dr. Purchase as to the desirability of co-operation between the medical profession and the coroner in these matters.—I am, etc.,

CYRIL BARON,
H.M. Coroner, County of Surrey, Eastern Division.

Pasteurization of Milk

SIR,—The Poole Borough Council, on the recommendation of its medical officer of health, has just adopted a resolution asking the Ministry of Health to pasteurize all milk intended for human consumption. I hope local authorities throughout the country will look into the condition of their milk supplies, and will likewise press the Ministry to take action in this important matter.

I have before me the latest quarterly report of the milk inspector of one of our important agricultural counties, which I have reason to believe represents in some approximate degree the average throughout this country. Out of 758 samples taken *from farms* in the county, 384 were unsatisfactory—i.e., over 50%. Out of 73 samples taken *from depots* where milk is collected, 57 were unsatisfactory—i.e., about 75%. From depots the milk goes to a variety of distributors. What deterioration takes place in their hands is not recorded. Perhaps it is just as well. In the same report it is stated that 62 samples of milk were taken for examination for the presence of tubercle bacilli, during the quarter, under Section 68 of the Food and Drugs Act, 1938. No results were given. The omission is very significant. One's mind turns to the free and subsidized distribution of crude milk to our young scholars and children generally under State direction, and to the recent increase of tuberculosis, and it becomes abundantly obvious that urgent measures are needed without delay to remedy a really serious menace to public health.

Poole Borough was seriously affected by the milk-borne outbreak of typhoid fever in 1936, and is still therefore milk-conscious. The Ministry of Health performed most meritorious service in connexion with that outbreak. Pasteurization may not be a perfect answer to the demand for a healthy and wholesome milk supply, but it is a ready and effective one. Even if it does deprive milk of a small percentage of food value, it ensures comparative safety.—I am, etc.,

Bournemouth. J. ROSS MACMAHON.

*** A leading article on pasteurization of milk appears at p. 727.—ED., *B.M.J.*

Control of Venereal Diseases

SIR,—I welcome your leading article (Nov. 21, p. 611), which I assume is an expression of disappointment with Defence Regulation 33B. It is difficult to see how the regulation can make much advance in the control of infections in the civilian population, which are increasing rapidly. In any case, no one (including the Ministry of Health) has any accurate knowledge of the incidence of these conditions in this country; surely that is the first question to tackle, and notification seems to me the only way to do it.

As regards comparison with other countries, I doubt exceedingly whether Dr. Margaret Rorke is right in suggesting that there is not the same sense of shame associated with V.D. in Scandinavia as still exists in this country, and unless we are prepared to change our moral ideas completely I suggest that it is a good thing that, in most cases, such a sense of shame should still exist. Neither am I prepared to accept Major S. M. Laird's 2.5% defaulter rate which he quotes for Sweden. One would need much more information as to how the figures were compiled; for a default rate of 2.5% means that for practical purposes default in Sweden is negligible and Utopia has been reached.

I, for one, am not among those who think that the present V.D. scheme in Britain is a failure; on the contrary, I am convinced that in many ways it has been a great success, but undoubtedly it can be improved, particularly by better education of our own profession. Heaven forbid that I should suggest additional compulsory examination in V.D. for final-year students, but I am sure that the ignorance to be seen, even to-day, in all classes of the medical profession is a very great contributory factor in the spread of these important diseases.

I think that the Ministry of Health or the General Medical Council might encourage the study of venereal disease by perhaps giving an annual prize—say of £10—to be awarded as the result of a voluntary examination for final-year students at each of the universities. I believe the money would be well spent.—I am, etc.,

Birmingham. E. W. ASSINDER.

Obituary

RUSSELL JOHN HOWARD, C.B.E., F.R.C.S.

The London Hospital has lost one of its best-remembered men in the death of Mr. R. J. Howard—"Russell John" to his colleagues—which took place on Dec. 4. He had been associated with the London Hospital as student, teacher, and member of the visiting staff for not far short of half a century, and was regarded by all with esteem and affection.

Russell John Howard was born in January, 1875, and educated at King's College School, London. He entered the London Hospital as a student in 1895, and graduated M.B.Lond., with first-class honours and the gold medal in medicine and forensic medicine, in 1899. He served as house-surgeon at "The London," and as demonstrator of anatomy at the medical college, also as surgeon to out-patients at the Royal Waterloo Hospital for Women and Children. Choosing general surgery as his department of practice, one for which he was excellently endowed, he took the M.S., again winning a gold medal, in 1903, and the F.R.C.S. in the same year. In 1908 he was elected to the honorary staff of his hospital, and there, alike for his ability in surgery and for his personal qualities, he built up a great reputation as surgeon—ultimately becoming senior surgeon—and as teacher. For teaching, Howard had exceptional gifts. Even after his retirement from the staff of the hospital three years ago on reaching the age limit he still continued to lecture to the students on surgery and on surgical nursing, the latter a subject to which he had devoted particular attention. It is fitting that on the walls of the college his portrait, beside those of Treves and others, should show him, not in academic robes, but in his more familiar white coat, giving a lecture.

Among other posts which he held were those of examiner in surgery for the Royal College of Surgeons, and examiner in nursing at Westminster Hospital, and he did good work as surgeon to the Poplar Hospital for Accidents. He also carried on a large consulting practice in Queen Anne Street, and he wrote a number of textbooks bearing such titles as *Practice of Surgery, Surgical Nursing, Surgical Emergencies,* the last a highly commended book published in 1924, and *House Surgeon's Vade Mecum.*

In the early part of 1939, in the emergency arrangements of sectors for the hospitals of London and the Home Counties, Russell Howard, as senior surgeon, was made head of the sector which has the London Hospital as its base. His retirement from the honorary staff of the London took place later in the same year, and was made an occasion by staff and students, past and present, for expressing appreciation of his outstanding work, his ever-ready helpfulness, and his modesty. In the report of the House Committee to the Court of Governors he was described as an eminent surgeon and an exceptional teacher. A fellow-surgeon who had been associated with him for seventeen years said how happy he would be to work under him as chief for another seventeen. He was described as an "institution" of the London, one who had exercised a profound influence on generation after generation of students and nurses; while as for his medical colleagues, he was one of the great promoters of professional amity, able to rub away any rough edges which may develop among men working together, and to make the staff into something resembling a happy family. In "London" men, wherever they might be, and however remote or recent their connexion with the Mile End Road, he took an immense interest. For many years he was treasurer of the Hospital Clubs Union, to which he gave long and untiring service, particularly in the raising of the funds for a new pavilion at Hale End. At the end of the last war he was made a Commander of the Order of the British Empire.

Dr. HENRY INGELDEW DAGGETT died at Boroughbridge, Yorks, on Nov. 7, aged 78. He studied medicine at the University of Cambridge and at St. Mary's Hospital, graduating M.A., M.B., B.Ch. in 1890. Before setting up in practice at Boroughbridge fifty years ago he had held house appointments at the Nottingham General Hospital. Dr. Daggett joined the B.M.A. in 1893, was chairman of the Harrogate Division in 1927-8, and served as its representative at the Annual Meeting of the Association in 1906. He was also a past president of the

Harrogate Medical Society, and an honorary life member of the St. John Ambulance Association. On his retirement from active practice in 1931 he received a public presentation from his friends and patients. His son, Mr. W. I. Daggett, F.R.C.S., is surgeon to the nose and ear department of King's College Hospital.

Medical Notes in Parliament

Bagassosis

Mr. HERBERT MORRISON said on Dec. 3 that he had received from medical inspectors of factories reports on the condition described as bagassosis, caused by the inhalation of dust from cane fibre or bagasse (see *British Medical Journal*, Oct. 24, p. 478, and Nov. 14, p. 577). It was now being considered by the Medical Research Council. Pending this investigation action could not be considered, but inquiries suggested that the condition was not suitable for inclusion in a scheme of compensation on the lines of the schemes for silicosis and other forms of pneumoconiosis.

Supplementary Medical Service of Scottish War Workers

On Dec. 8 Mr. PETHICK LAWRENCE asked the Secretary of State for Scotland whether he had extended the area of the experiment in diagnosis and treatment of workers initiated in the Clyde Valley. Mr. JOHNSTON replied that the supplementary medical service which had operated in the Clyde Valley since January last had now been extended to cover workers of all ages in the industrial areas of Scotland. He had the entire concurrence of the doctors in this matter. The first experiment covered 44% of the insured workers. Replying to Dr. Summerskill, who asked if the extension included dependants, Mr. Johnston said it dealt with workers. Dr. Summerskill asked if a housewife was a worker, and Mr. Johnston said she was if she was a war worker. He also told Mr. McNeil that he was absolutely satisfied that there were sufficient beds to meet all kinds of cases referred for hospital treatment under this scheme.

Small-pox and Vaccination in Scotland

On Dec. 8 Mr. VIANT asked the Secretary of State for Scotland in how many cases in the recent vaccination campaign in the Methilhill district was vaccination carried out in several insertions in violation of the instructions issued to public vaccinators. Mr. JOHNSTON said that the instructions to which Mr. Viant referred did not apply to Scotland. The recommendations on technique issued by the Department of Health for Scotland included scarification with three strokes one-eighth of an inch apart, but these recommendations were not legally binding. It was not known in how many cases this recommendation was carried out by doctors.

Mr. Johnston added that he was aware that some of the original cases of small-pox at Methilhill were at first diagnosed as chicken-pox by the assistant medical officer called in by the medical attendants. He was advised that the diagnosis of small-pox in its early stages was not always easy.

In reply to another question Mr. JOHNSTON said that according to the information at present available there had been 9 deaths in Scotland following vaccination during the recent outbreaks of small-pox, when about 1,000,000 vaccinations were performed. Seven of these were registered as due to encephalitis (2 in Glasgow, 3 in Edinburgh, and 2 in Fife), 1 in Glasgow due to erythema, and 1 in Lanarkshire due to toxaemia. In addition, there was 1 death in Glasgow due to measles, vaccination being stated to be a contributory cause.

Compensation for Pneumoconiosis

The Workmen's Compensation Bill was set down for consideration in the House of Commons on the next sitting day after Dec. 3. This Bill proposes to extend Section 47 of the Workmen's Compensation Act, 1925, to workmen suffering from pneumoconiosis and to provide for the payment of benefit in the case of such workmen; to enable the Treasury to contribute to certain medical expenses; to amend certain provisions of the Coal Mines Act, 1911, relating to siliceous rock; and to amend the provisions of the Workmen's Compensation Acts, 1925 to 1941, relating to examining surgeons. The term "pneumoconiosis" is defined as fibrosis of the lungs due to silica dust, asbestos dust, or other dust, and includes the condition of the lungs knows as dust-reticulation.

In the House of Commons on Dec. 8 Mr. PEAKE moved the second reading of the Workmen's Compensation Bill, which, he said, made provision for an industrial disease that had been the subject of an inquiry begun by a committee of the Medical Research Council in 1936. The committee's investigations had established a form of pneumoconiosis which differed from silicosis and could not be said, on present information, to be due to silica dust. It could be distinguished by both radiological and pathological methods, and was due to inhalation of air-borne dust in the course of employment. It was found to exist not only in the anthracite area but throughout the South Wales coalfield, though incidence and severity varied greatly in different regions. It was also found in surface workers employed on the screens, and in coal-trimmers in the dockyards of South Wales. There was confirmation of this from the Silicosis Medical Board, which had examined cases from other coalfields similar to those found in South Wales. In the mines the root cause of the trouble was the dust inevitably produced in the normal process of getting coal, and was accentuated by shot-firing.

Clause I extended Section 47 of the Act of 1925, which enabled compensation schemes to be made for fibrosis of the lungs due to silica dust or asbestos dust, to any form of pneumoconiosis. It would enable a unified compensation scheme to be made for silicosis and pneumoconiosis. The liability for compensation in respect of future cases would fall on the individual employer. Clause 2 enabled a benefit scheme to be made for dealing with cases of men who had already left the industry since the comprehensive scheme for silicosis in coal mines was introduced in 1934 but who had no right to compensation. It was proposed to pay 15s. a week in addition to national health insurance benefits in cases of total incapacity, and a death benefit to a widow at a flat rate of £250.

Under Part II of the Act of 1925, in the case of industrial disease, a certificate of disability could be granted only by the examining surgeon for the district in which the disease was contracted and the workman was employed. Directions would now be given which would empower an examining surgeon in the district in which a workman might be residing to give the necessary certificate.

Mr. DAVID GRENFELL expressed a hope that out of the scheme provided in Clauses I and II there would come a regularly constituted board with a fund, financial resources, medical advice, and a clinical organization. Mr. ISAACS said that the clause which allowed the Home Office certifying surgeon to certify in the district where a man happened to be living was a very valuable concession.

National Service: Earlier Enrolment of Youths

In the House of Commons on Dec. 8 Mr. ERNEST BEVIN moved the second reading of the National Service Bill. He explained that the Government did not intend to lower the age of liability to military service below 18, but the military situation was such that it was necessary to make it possible to enrol young men at 18. At present it was from 18 years and 4 months to 18 years and 6 months before a person liable at 18 could be enlisted, and it was necessary to have a Proclamation and registration and medical examination after reaching 18 years of age. The Bill provided that all these preliminary steps should take place at 17 years and 8 months. It might well be necessary, as the war progressed and casualties occurred, to go up into the higher age limits, but the Government desired to avoid that as much as possible. Experience showed that it took about four age classes at the upper end of the scale to give the same number as one class at the lower end. That was mainly due to reasons of health and to physical capacity of the people called up.

Mr. JOHN DUGDALE, speaking of the medical inspection of the boys who were called up, said he served for some months in a young-soldier battalion. These men were volunteers, but some of the medical inspections were nothing short of ludicrous. At least 10% of the boys who came into the young-soldier battalions were totally unsuited to go into the Army at all.

Mr. HARVEY asked for an assurance that where a university student was in the academic year in which he would become 18, if his work was satisfactory and he had a certificate to that effect from the proper authority, he should be able to complete the academic year.

Mr. MCCORQUODALE, replying to the debate, said it would not be possible to defer calling up beyond June, 1943, to enable boys to take a course of study in arts at the universities. In the present strenuous and serious position of the war, they could not continue those courses. They were continuing to make arrangements for the reservation of boys accepted as medical and dental students. The Bill was read a second time by 267 votes to 5.

False Certification and Criminal Proceedings

Sir DONALD SOMERVELL, replying on Dec. 9 to Sir Jocelyn Lucas, said the Director of Public Prosecutions made a full investigation in 1940 into the activities of a doctor who was recently struck off the *Register* for giving bogus certificates to

men to enable them to evade military service, and into other similar cases. It was decided then that the available evidence did not afford a basis for criminal proceedings. Since Sir Jocelyn put his question down inquiries had been made to see whether the position had altered so far as evidence for criminal proceedings was concerned. Sir Donald did not think it had. He added that as a result of the investigation in 1940 a Defence Regulation was made strengthening the law on the subject. This was not applicable to acts done before it was made.

School Medical Inspection.—Mr. LIPSON on Dec. 3 asked Mr. Butler to withdraw Circular 1604, which recommended curtailment of medical inspection of children in elementary schools. Mr. BUTLER said he could not do so. The medical man-power position necessitated the recommendations made in the circular. He regretted that in some areas the staff was insufficient to carry out the full programme of medical inspection.

Diet of Tuberculous Persons.—Mr. BROWN stated on Dec. 3 that the special dietary needs of tuberculous persons had been considered by the medical committee, including medical officers of the Ministry of Health, which advised the Minister of Food. Persons with active tuberculosis had a priority right to an extra allowance of milk, but limitations of supply and the needs of others did not at present permit an extra ration of eggs to tuberculous persons nor provision of extra milk for their contacts.

Notes in Brief

The number of cases of non-pulmonary tuberculosis notified in the County of London was 1,281 in 1938 and 903 in 1941, representing a decrease of 29.5% between those two years. Deaths from tuberculosis among children under 15 years of age in the administrative county of London numbered 197 in 1938 and 220 in 1941—a 12% increase.

Universities and Colleges

UNIVERSITY OF LONDON

G. A. R. Kon, M.A.Camb., D.Sc.Lond., has been appointed as the first occupant of the University Chair of Chemistry tenable at the Royal Cancer Hospital (Free), which was instituted just before the outbreak of war. Dr. Kon has been a member of the staff of the Imperial College of Science and Technology since 1925, the title of Reader in Organic Chemistry being conferred on him by the Senate in 1935.

ROYAL COLLEGE OF SURGEONS OF ENGLAND

The following candidates were successful in the recent Primary Fellowship Examination:

R. C. Barclay, H. W. A. Baron, M. S. Brett, J. B. Brierley, A. E. Carter, J. C. Dundon, N. Gillman, M. Harty, H. G. S. Korvin, R. W. P. Mellish, S. Muntarbhorn, W. S. Peart, J. H. Penrose, P. F. Philip, A. F. Robinson, Mary G. Shaw, O. L. Wade, Christine M. Weddell, W. R. Welply, F. R. Wilde.

ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW

At a meeting of the Royal Faculty of Physicians and Surgeons of Glasgow, held on Dec. 7, the President, Mr. J. H. MacDonald, in the chair, the following were admitted Fellows of Faculty *qua* Physician: J. Black, M.B., C. Borg, M.D., G. G. Browning, M.B., A. J. V. Cameron, M.B., G. M. Currie, M.B., D.P.H., A. Dunn, M.B., D.P.H.; H. B. Young, M.B., Ch.B., D.P.H., was admitted a Fellow of Faculty *qua* Surgeon.

The Services

The King has approved the publication of the name of Lieut. (Temp. Capt.) K. I. H. Henry, R.A.M.C., as having been commended for brave conduct.

Prob. Temp. Surg. Lieut. G. H. Murray, R.N.V.R., has been mentioned in dispatches.

CASUALTIES IN THE MEDICAL SERVICES

Temp. Surg. Lieut. ALFRED LEIGH PHILLIPS, R.N.V.R., is reported "missing, presumed killed" on active service last month. He was the son of Dr. F. E. and Mrs. Leigh Phillips of Milton, Berks, and graduated M.B., B.Chir. of the University of Cambridge in 1939. After holding a post at the Victoria Hospital for Children, Chelsea, he entered the R.N.V.R. in April, 1941.

Prisoners of War.—War Subs. Capt. R. W. Doyle, R.A.M.C., Lieut. B. I. Evans, I.M.S., War Subs. Capt. B. F. B. Gulliver, M.C., R.A.M.C., Acting Major T. McLardy, R.A.M.C., War Subs. Capt. J. McQuilian, R.A.M.C., War Subs. Capt. F. J. D. Webster, R.A.M.C.

DEATHS IN THE SERVICES

Major-General HOWARD ENSOR, C.B., C.M.G., C.B.E., D.S.O., late R.A.M.C., died on Nov. 22 at the age of 68. He was educated at Trinity College, Dublin, and graduated B.A. in 1895 and M.B., B.Ch. in 1897, in which year he also obtained the L.M. of the Rotunda Hospital. Before joining the regular Army he was in the West African Frontier Force. He served in the South African War with the R.A.M.C., receiving the D.S.O., the Queen's medal with four clasps, and the King's medal with two clasps. In 1902 he was seconded to the Egyptian Army and did excellent work in the Sudan, being awarded the Order of Osmanieh in 1910 and of the Medjidieh in 1912. After promotion to the rank of major he was restored to the British establishment and served with much distinction in the war of 1914-18, being mentioned six times in dispatches, promoted brevet lieut.-colonel, and awarded the C.M.G. He became substantive lieut.-colonel in 1915, colonel in 1925, and major-general in 1929. For the next four years he was D.D.M.S. Eastern Command, and honorary surgeon to the King 1930-3; in 1937 he was appointed Colonel Commandant of the R.A.M.C. He had been awarded the C.B. in 1923 and the C.B.E. in 1928. General Ensor was a member of the B.M.A. and had served on the Egyptian Branch Council.

Col. GEORGE WASHINGTON BRAZIER-CREAGH, C.B., C.M.G., late R.A.M.C., died in London on Oct. 10. He was born on June 20, 1858, and was educated at Trinity College, Dublin, where he took the L.Med. and L.Ch. in 1880. Entering the Army in 1881, he became lieut.-col. after twenty years' service, and retired in 1911. During his service he conducted missions to South-East Persia in 1893-4; to Seistan, Persia, in 1896-7, making extensive explorations of little-known regions throughout Eastern Persia and Baluchistan, and opening up the Seistan-Nushki trade route, being thanked for his work by the Government of India. He took part in the Punjab frontier expedition of 1897-8 (medal and clasp); accompanied the Peking syndicate throughout North China in 1898-9; served throughout the South African War of 1899-1902, taking part in the relief of Ladysmith, including the actions at Tugela Heights, Vaal Krantz, Spion Kop, and subsequently in operations in Natal, the Orange Free State, and the Transvaal, being three times mentioned in dispatches. He received the Queen's medal with six clasps and the King's medal with two clasps, and was appointed a C.M.G. in 1901. He rejoined for service in the war of 1914-18 and was promoted col. in 1919. He served in France and Flanders as A.D.M.S. of the 39th Division, was mentioned in dispatches four times, and was appointed a C.B. in 1917.

Medical News

A gift in kind of drugs to the value of £1,015 has been made to Mrs. Churchill's "Aid to Russia" Fund by Lord Trent on behalf of Boots Pure Drug Co. Also as a gift to this fund the employees of George Gill and Sons (Sheffield), Ltd., in their own time are replacing 500 Spencer Wells forceps valued at £100 and lost by enemy action.

Sir Bernard Spilsbury has been appointed honorary treasurer of the Medico-Legal Society, in place of the late Sir Walter Schroder.

Dr. M. T. Morgan, medical officer of health for the Port of London, has consented to act as consultant to the Ministry of War Transport on questions affecting seamen's health.

Dr. W. St. John Cogan has been appointed a justice of the peace for the County of the City of Edinburgh.

Dr. Jean-David Buffat has succeeded the late Prof. Jean Rossier as director of the Surgical Clinic at Lausanne.

Persons suffering from certain skin diseases may buy "household type" rubber gloves without a permit if they have a medical certificate stating that they are suffering from long and intractable eczema, or cheiropompholyx, or intractable dermatitis, and need these gloves for their household duties.

Fifty per cent. of the inhabitants of Central and Eastern Finland and from 2 to 30% of the inhabitants of Western and Northern Finland are infested with *Dibothriocephalus latus* owing to the consumption of raw and badly salted fish.

Medical officers of health are now asked to send to the Ministry of Health, in accordance with Public Health (Tuberculosis) Regulations, 1942, the necessary particulars concerning women born in the year 1922 who have a history of tuberculosis. The information should be supplied as before on Form T.147(W).

Dr. William Chisholm, who was on board a ship in the Merchant Navy which was sunk by a torpedo, is reported to be missing.

A recent conference called by the Hospital Almoners' Association to discuss a survey of the almoner's work in hospitals to-day which had been prepared at its request agreed that the almoner's most important function—her medico-social work among patients—was often either overlooked by committees of management or seriously limited by far too many clerical duties. Only those administrative duties, it was considered, which affected the welfare of the patients should be done by the almoner's staff. Both the Ministry of Health and the subcommittee of the Royal College of Physicians which has under consideration the teaching of social medicine to medical students recognize the contribution to be made by almoners in this field. The former has asked the profession to draft plans of the part practising almoners can take in this instruction, while the Royal College has asked for outlines of an almoner's model unit in a hospital to facilitate the teaching and the practice of social medicine.

A Joint Council of Professional Scientists, representing over 10,000 qualified scientists, has been set up under the chairmanship of Sir Robert Pickard, F.R.S., by the Institutes of Chemistry and Physics in association with representatives of professional botanists, geologists, mathematicians, and zoologists. It has been established for the period of the national emergency, but it may form the nucleus of some more permanent organization to facilitate the close collaboration between professional men and women practising in all branches of science. Communications to the Council should be addressed to Dr. H. R. Lang, honorary secretary, Joint Council of Professional Scientists, c/o the Institute of Physics, at its temporary address, the University, Reading, Berks.

It is reported that the total area under cultivation with medicinal plants and herbs in the German Reich amounted in 1941 to about 40 square miles. Of this about 5 square miles is in the newly acquired territories.

EPIDEMIOLOGICAL NOTES

Discussion of Table

In *England and Wales* during the week the incidence of measles rose by 1,833 while the notifications of diphtheria fell by 140. Dysentery notifications went up by 46, and further rises were reported in the other infectious diseases.

Small increases in scarlet fever were fairly general throughout the country, the largest being 38 and 32 for Essex and Surrey. But in Yorks West Riding there was a decline of 67 cases.

There were fewer notifications of diphtheria in most counties, the only notable drop occurring in Lancashire, where there were 38 fewer cases than in the preceding week.

There were 29 and 23 fewer cases of whooping-cough in Middlesex and Yorks West Riding, and 22 more in Staffordshire.

The notifications of measles are still higher in the North than in the South. The largest rises were Yorks West Riding 527, Lancashire 373, Wales 245, Leicestershire 197, Nottinghamshire 119, Southampton 102. Despite the upward trend throughout most of the country, a fall in the notifications was recorded in Derbyshire 117, and London 55.

The only new outbreak of dysentery during the week was from Derbyshire, 26 cases (Belper R.D. 25, Ashbourne R.D. 1). Increases occurred in the existing widespread outbreaks in Lancashire, from 24 to 32 cases, and in Surrey, from 7 to 18 cases. In Lancashire six administrative areas were involved, with the principal centre in Manchester C.B., 14 cases; and in Surrey the cases were recorded from five areas, the largest total being Banstead U.D. 11. In London there were 14 cases (a decrease of 4) in ten boroughs.

In *Scotland* there were still further rises in the incidence of measles and whooping-cough, but diphtheria and scarlet fever are on the downgrade. Measles went up sharply from 80 to 139 in the city of Dundee.

In *Eire* the most notable feature of the returns was the sudden fall from 25 to 5 in the weekly number of cases of poliomyelitis; this was the lowest total since the week ending Aug. 22, when the outbreak began. Notifications have averaged just over 20 a week during the past three months. There has been a further case of typhus in the rural district of Galway, Co. Galway.

Small-pox

After an interval of eight days without a case 5 more cases of small-pox have been reported from Edinburgh: in 3 of these the patients belonged to one family, and 1 woman of 58 died after admission to hospital, thus bringing the deaths in Edinburgh up to 6.

Returns for the Week Ending December 5

The notifications of infectious diseases in England and Wales during the week included: scarlet fever 2,900, whooping-cough 1,195, diphtheria 1,011, measles 11,205, acute pneumonia 890, cerebrospinal fever 73, dysentery 191, paratyphoid 5, typhoid 4.

No. 47

INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended Nov. 28.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for: (a) England and Wales (London included). (b) London (administrative county). (c) Scotland. (d) Eire. (e) Northern Ireland.

Figures of Births and Deaths, and of Deaths recorded under each infectious disease, are for: (a) The 126 great towns in England and Wales (including London). (b) London (administrative county). (c) The 16 principal towns in Scotland. (d) The 13 principal towns in Eire. (e) The 10 principal towns in Northern Ireland.

A dash — denotes no cases; a blank space denotes disease not notifiable or no return available.

Disease	1942					1941 (Corresponding Week)				
	(a)	(b)	(c)	(d)	(e)	(a)	(b)	(c)	(d)	(e)
Cerebrospinal fever	77	4	27		9	114	5	32		2
Deaths		—	2				1	1		
Diphtheria	861	39	228	97	12	1,082	38	324	56	43
Deaths	17	—	4	5	—	27	—	7	2	1
Dysentery	163	15	65	—	—	209	7	66	—	—
Deaths			—	—	—			—	—	—
Encephalitis lethargica, acute	1	—	1		—	2	1	1	—	—
Deaths		2	—				—	—		
Erysipelas		—	67	9	—		—	55	8	3
Deaths		—	—				—	—		
Infective enteritis or diarrhoea under 2 years				42						
Deaths	36	5	19	20	2	35	2	7	17	4
Measles	10,649	307	456	33	43	639	47	32	49	4
Deaths	10	1	2	—	—	—	2	—	1	—
Ophthalmia neonatorum	82	5	22		2	59	2	23		—
Deaths										
Paratyphoid fever	4	—	3	—	1	18	—	6	—	
Deaths		—	—	—	—		—		—	
Pneumonia, influenzal*	766	51	13	3	11	1,100	45	15	1	2
Deaths (from influenza)	35	7	3	—	—	25	5	5	2	1
Pneumonia, primary			216	10				205	14	
Deaths		—		16	13		34		11	4
Polio-encephalitis, acute	6	—				—	—			
Deaths		—					—			
Poliomyelitis, acute	18	—	—	5	4	13	1	2	4	—
Deaths		—					—	—		
Puerperal fever		—	14	—	—		—	13	—	—
Deaths	—	—				—	—			
Puerperal pyrexia	161	11	21	—	1	142	11	13	1	
Deaths										
Relapsing fever	—	—			—	—	—			
Deaths										
Scarlet fever	2,970	148	401	61	68	1,417	46	256	59	40
Deaths	2	—	1	—	—	3	—	—	1	—
Small-pox	1	1	3	12	—	—	—	—		—
Deaths		—	—	—	—		—	—	—	—
Typhoid fever†	13	—	—	12	2	10	1	3	6	3
Deaths	—	—	—	1	—	1	—			
Typhus fever	—	—	—	1	—	—	—	—	—	—
Deaths			—	—	—			—	—	—
Whooping-cough	1,263	75	52	35	5	1,995	210	83	39	8
Deaths	13	2	3	1	—	9	2	4	1	—
Deaths (0–1 year)	309	40	71	52	19	358	22	74	44	19
Infant mortality rate (per 1,000 live births)										
Deaths (excluding still-births)	4,508	703	615	212	141	4,461	624	630	198	121
Annual death rate (per 1,000 persons living)			13·8	14·2	‡			13·7	13·1	‡
Live births	5,576	675	789	363	256	4,773	392	809	249	221
Annual rate per 1,000 persons living			16·3	24·2	‡			16·5	16·5	‡
Stillbirths	188	7	36			192	13	34		
Rate per 1,000 total births (including stillborn)			44					40		

* Includes primary form for England and Wales, London (administrative county), and Northern Ireland.

† Includes paratyphoid A and B for Northern Ireland.

‡ Owing to evacuation schemes and other movements of population, birth and death rates for Northern Ireland are no longer available.

Letters, Notes, and Answers

All communications in regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, LONDON, W.C.1.

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QUERIES AND ANSWERS

Wartime Diet and Miscarriage

Dr. H. W. H. HOLMES (Burnham-on-Sea) writes: With reference to your article, "Wanted: A Nutrition Policy" (Nov. 28, p. 640), is there any indication that the present wartime diet has any effect on miscarriages, which seem to be taking place in an unusually large number, and how can it be rectified?

Dressing for Cancer of Breast

Dr. W. G. B. HALLIDEN (Stroud) writes: In answer to "Deodar" (Nov. 28, p. 654) I would suggest the daily application of a liberal quantity of sulphanilamide powder. This can be dusted on straight from the container and a dressing of liq. paraffin or liq. paraffin and eusol emulsion applied. I have found with this treatment that the ulcerating area shows a healing tendency, the discharge diminishes, and a marked deodorizing effect is obtained.

"INOFFENSIVE" writes: A mixture of charcoal and iodoform will prevent the smell. This can be used as a powder or made into an ointment, and 5% or less of iodoform will suffice.

"M" writes to say that "Deodar" will find eusol effective.

Income Tax

Liability to Tax

"Colonial", arrived from abroad, on leave, in this country on Oct. 10, 1942. He has no permanent residence here. He inquires as to the circumstances in which he may become liable to British income tax.

⁂ It is assumed that he has not paid habitual but only occasional visits to this country in recent years. The statutory rule provides that a person who is resident abroad and comes to the United Kingdom is *not* liable for tax if he is here, for some temporary purpose, without the intention of establishing his residence here and his stay does not last for a period of six months in any one financial year. It follows, therefore, that "Colonial" cannot be regarded as a British resident until Oct. 5, 1943—as the present financial year ends on April 5, 1943—unless in the meantime he forms the intention of establishing his residence here. If he does become liable as a resident he will be assessable *for the year* in which he becomes liable, but not in respect of pay not remitted to the United Kingdom.

LETTERS, NOTES, ETC.

Adequate Vaccination

G. D. G. (Dalkeith) writes: Sir Alexander Macgregor and Dr. Peters refer in their article on the 1942 outbreak of small-pox in Glasgow (*Journal*, Nov. 28, p. 627) to unsuccessful vaccinations and revaccinations. Frequently people say they have "been done" but as it never took they suppose they are immune; this is a widespread fallacy. I have received a letter from a retired matron of Indian Government hospitals who says: "I have been in the throes of vaccination. In India I used to be done every year but it never once took. I was done last July by a doctor on the Edinburgh M.O.H.'s staff without result, so when small-pox started I was again unsuccessfully vaccinated. The doctor told me to come up again to see him in a week. This time a lady doctor did me and it took very well. This is the first time in all my life that it has taken at all. I was always told I was immune but never believed it." A weak spot in the Vaccination Order of 1929 was the direction given to public vaccinators to make a single linear incision instead of the scarification hitherto practised. In the Glasgow outbreak the single-stroke technique was discarded and three incisions were adopted as the standard practice. A single unsuccessful vaccination was not accepted as evidence of immunity. There is room yet for more attention being paid to *adequate* vaccination. The lack of this adequacy has given the conscientious objector a weapon to hammer against this wonderful measure for securing small-pox immunity.

First-aid Treatment for Fractured Spine

Dr. A. R. NELIGAN (Droitwich) writes: I agree with Lieut.-Col. J. L. Moir (Oct. 31, p. 529) about the need for a simple standard method. I suggest that the following way of lifting men on to the stretcher is better even than his five bandages, if only because poles will not always be handy. Four bearers: one for the head, one for the legs, one on each side of the trunk grasping the tightly rolled edges of the unbuttoned blouse (or jacket) with hands as far apart as possible. Untrained men can lift a heavy patient easily and correctly in this way; he lies, as it were, in a hammock but with no sagging, and can be moved with very little disturbance.

Lieut.-Col. J. L. MOIR (Anglesey), in the course of a further letter, states that in order to distinguish his method for the first-aid treatment of fractured spine (*Journal*, Oct. 31, p. 529) from others it has been decided to call it the Clarke-Moir method, and he will bring it to the notice of the B.R.C.S. and the Orders of St. John and St. Andrew. But before doing this, as the matter is of considerable importance, he is referring the method to the British Orthopaedic Association for their consideration and approval or otherwise. He continues: Dr. J. L. McKenzie Brown, First-aid Commandant, Civil Defence Service, Walthamstow, wrote me that he thought Procedures VI and VII in the order of my treatment should be transposed—that is, the lower limbs should be tied together by triangular bandages *before* the patient is turned on his back. We quite agree with this, and think this alteration should be made.

MEDICINE 100 YEARS AGO

Extracts from a leading article on the regulations of the Royal College of Surgeons relating to admission to the college diploma; from the *Provincial Medical Journal* of Dec. 17, 1842:

"In October, 1841, the college published certain regulations, respecting the professional education of candidates for their diploma. Under these regulations a very respectable course of education was prescribed, including, amongst other improvements, attendance on the practice of surgery at some recognized hospital during a period of three years; and attendance on the practice of medicine during a period of one year. It was also announced by the council 'that after October 1, 1842, candidates would *only* be admitted to examination under the regulations alluded to, except under peculiar circumstances of apparent hardship.' The amended regulations of October, 1841, were promulgated under the authority of the council of the College of Surgeons, and students had prepared themselves for the more costly and extensive acquirements expected from them, when, in the course of the present year, a rumour got abroad that the college was privately admitting great numbers of practitioners, without any regard to their own regulations—without requiring from them the same proofs of professional education, which less favored individuals were compelled to furnish. . . . On the 18th of November last the college sent forth the following extraordinary document:—

"'ROYAL COLLEGE OF SURGEONS OF LONDON

"'The Court of Examiners having found that erroneous statements have lately been published respecting the mode in which gentlemen engaged in the practice of surgery may obtain the diploma of the college, and that other candidates for the diploma have experienced difficulty and inconvenience from inattention to the regulations, by which the required course of study has been, from time to time, augmented, or from inability to comply with those regulations, have resolved: That gentlemen who were practising surgery prior to 1835, be admitted to examination on producing proofs of such anatomical and surgical education as may be deemed sufficient by the Court of Examiners. That other candidates be admitted to examination upon the production of the several certificates required by the regulations in force when they began their professional education by apprenticeship, or by attendance on lectures or hospital practice.

"'EDMUND BELFOUR, Sec.

"'November 18, 1842.'

"Though unwilling, at any time, to attribute other than honorable motives to respectable men, we must say that the preceding resolutions of the college require explanation. The motive alleged in the preamble, if we may so call it, is illusory, and a contemptible blind to deceive the profession. If 'erroneous statements had lately been published,' why not correct them in the usual manner? The periodical press is ever ready to assist the college in the correction of error and the dissemination of truth. But the statements were not erroneous. The error—the deceit—lay with the college; and it is little less than a barefaced subterfuge to make the correction of an error, which was of their own making, the pretence for issuing regulations totally unworthy of the college, and at variance with the spirit of the age."